NATIONAL INSTITUTE ON AGING

SEVENTH REPORT TO COUNCIL ON PROGRAM OCTOBER 1985

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FOREWORD

This report describes the research activities conducted by the National Institute on Aging (NIA) during fiscal year 1985 and initiatives proposed for future years.

In the first section, the Report of the Director summarizes the Institute's research priorities and objectives. A number of graphs and tables have been provided to illustrate funding trends among the various programs and award mechanisms. Lists of grants and contracts supported by the Institute during the year have also been included.

The remainder of the report describes in detail the activities of the Institute's offices and three of its program areas (Biomedical Research and Clinical Medicine, Behavioral Sciences Research, and Epidemiology, Demography, and Biometry), including planning efforts and implementation strategies, research highlights for fiscal year 1985, and plans for program development in future years. This year a brief overview of the Intramural Research Program at the Gerontology Research Center in Baltimore has been added, along with a chart of its recently approved reorganization.

T. Franklin Williams

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REPORT OF THE DIRECTOR

In 1985 the National Institute on Aging celebrated the tenth anniversary of its establishment as the eleventh institute of the National Institutes of Health. By any measure the growth of research on aging fostered by the NIA during this decade has been remarkable. The annual budget to support expanding programs in extramural and intramural research, training and resource development has increased seven-fold, from the Institute's first separate appropriation of $19 million in FY 1976 to $144 million in FY 1985. These funds have been strategically invested in a broad range of basic and clinical studies on the biomedical, behavioral, and social aspects of the aging phenomenon. They have also been used to develop trained scientists and clinicians and associated research and academic leadership and to develop the unique research resources required for aging-related investigations. The following selected initiatives illustate the breadth of issues addressed by the Institute:

- NIA has spearheaded a national research effort on the many aspects of Alzheimer disease and other dementing disorders. In the last two years it has funded special Alzheimer Disease Research Centers at ten universities throughout the country to coordinate multidisciplinary investigations both within and between the participating institutions.

- Teaching Nursing Home Awards have been granted to seven institutions to conduct research on health problems that are particularly prominent in nursing homes and among geriatric outpatients.

- The Institute has developed four Established Populations for Epidemiologic Studies of the Elderly, including a new, predominantly black population. These population studies are designed to provide information about the characteristics of aging and identify specific and potentially correctible etiologies.

- The Baltimore Longitudinal Study of Aging, initiated in 1958, has continued to collect data on approximately 1,000 healthy volunteers, including a female cohort added in 1979. This study continues to lead the way in differentiating between changes that are due primarily to aging and those attributable to disease or environmental influences.

- Large colonies of aging animals, including primates, and a depository of cell cultures for aging studies, all largely unavailable before the Institute's establishment, have been developed and supported by NIA in order to provide appropriate resources to grantees and other investigators in aging research.

- A number of collaborative projects have been undertaken with other Institutes and Federal agencies in order to maximize efforts in areas of overlapping interest. For example, a clinical trial for treatment of Systolic Hypertension in the Elderly Population is being cofunded by NIA and the National Heart, Lung, and Blood Institute. Clinical trials of

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behavioral therapies for urinary incontinence are being cofunded by NIA, the Division of Nursing of the Health Resources and Services Administration, and the Health Care Financing Administration.

- New biochemical techniques, such as recombinant DNA methods, are providing additional opportunities for research on aging, and program emphasis is now being placed on the recruitment and training of the pool of scientists needed to exploit these opportunities.
- The Institute has supported a number of innovative training mechanisms to develop the necessary investigators, clinicians, and teachers. Among these mechanisms has been the Geriatric Medicine Academic Award that enabled medical schools to establish or expand geriatic medicine curricula and foster research and careers in aging; the individual and institutional Physician Scientist Awards that train clinicians interested in aging in the skills required for independent research and provide research experience in a fundamental science; the Geriatric Leadership Academic Award that supports, through an identified faculty catalyst, an environment conducive to and encouraging of faculty and student research; and the newest mechanism, the Complementary Training Award for Research on Aging, which is described later in this report.

From these endeavors and others, evidence continues to accumulate that aging itself is not an inevitable cause of reduced physical and mental functioning and that through such research and the application of its results, many of the adverse changes and diseases associated with growing old can be favorably affected.

This Seventh Report to Council on Program describes activities carried out by the Institute in FY 1985, and those to be undertaken in FY 1986 and beyond, that continue to build on the foundation laid over the past ten years. It describes many of the significant findings obtained from research supported by the Institute as well as the programming efforts of NIA staff to develop research initiatives, training opportunities, and resource availability.

High Priority Areas in Research and Training

The following sections summarize the areas of high priority that are guiding the efforts of NIA. Their selection has been based on the experience and judgment of the National Advisory Council on Aging, on advice from expert consultants in the scientific community, and on recommendations from the staff of NIA. They reflect high levels of scientific opportunity that currently exist in both the extramural and intramural programs. These priorities do not encompass the full range of research and training activities conducted by the Institute, which are discussed in more detail in a later section of this report.

1. Understanding Aging

Improved understanding of the aging process continues to be a major objective of this Institute. Significant findings concerning the characteristics of the aging process and how it can be distinguished from disease processes can be obtained from longitudinal studies, broad-based population investigations, and research on biomarkers in animal models. Examples of research initiatives in these three areas are described below.

- The Baltimore Longitudinal Study of Aging (BLSA), supported by the NIA Intramural Research Program, was initiated in 1958 to permit repeated observations of the same subjects over a long period of time in order to quantify changes with aging and elucidate the mechanisms underlying these changes. The study population is a group of approximately 1,000 community-dwelling volunteers ranging from 20 to 98 years of age who are enrolled for their lifetimes and are reevaluated every two years. The highly characterized BLSA population and the multidisciplinary and multivariate approach employed offer unique opportunities for clinical investigations. Emphasis has been placed on continued expansion of the female cohort, recruiting participants aged 75 and above, introduction of new techniques or technologies as they become available, and developing research areas that have not previously been pursued due to resource constraints. Illustrative studies include investigations of neuroendocrine, metabolic, and cardiopulmonary responses to various exercise regimens; the effects of obesity at different ages on overall health status as well as on patterns of change in body composition with aging; nutritional practices across the adult age span; the relationship of circulating sex steriod hormones to coronary atherosclerotic disease in BLSA men; responsiveness of the pituitary to known hypothalamic releasing factors; evaluation of the immune function of BLSA participants to determine age-associated changes and the possible effects of these changes on the incidence and type of disease; measures of personality and their relation to social and personal adjustment and medical outcomes; and longitudinal assessment of cognitive performance and aging. Collaborative efforts in areas of mutual interest consistent with BLSA objectives continue to be pursued with extramural scientists and institutions. In FY 1985 an Associate Scientific Director was recruited to manage the BLSA and to assist scientists in its use.

- The Established Populations for Epidemiologic Studies of the Elderly (EPESE), which were initiated in 1980, have now been extended for an additional 3 years. A fourth population, primarily black, has been introduced, bringing the total number of people under study to approximately 14,000. Studies in Hispanic populations are planned, depending on the availability of funds. Four major components of these studies (morbidity and mortality, nursing home admission, hospitalization, and disability) are now being analyzed for the first two years of follow-up. Preliminary findings indicate that disabilities and cognitive declines increase rapidly with age, but the patterns by age and sex show intriguing differences in these areas. Prevalence of hypertension and use of antihypertensive medication are strikingly similar in the three populations.

- Biomarkers of aging are currently being investigated by NIA grantees. These biomarkers are needed to assess rates of aging in animal models and humans within a timeframe that is experimentally feasible. A set of biomarkers is required for each of the species commonly used in research on aging, ranging from lower organisms through rodents, nonhuman primates, and humans. To the extent possible, biomarkers with broad species generality should be developed, both to understand the generality of aging phenomena and to permit research applicable to humans to be conducted at the simplest and most economic phylogenetic level. Development of biomarkers is currently being pursued in mice, rats, nonhuman primates, and humans. A major feature of the rodent resources is the use of dietary restriction, which is an intervention clearly shown to have a significant effect on life span in any species. The biomarker development contracts are a major part of an NIA ten-year plan to develop a generally accepted set of biomarkers of aging for use in intervention testing and in research on the basic processes of aging.

2. Molecular Genetics of Aging

Recombinant DNA technology is providing powerful tools for exploration of gene structure and function. These techniques have already been extremely useful in exploring genes involved in normal and abnormal cell growth, i.e., oncogenes. It is now timely to apply these techniques to the study of the molecular genetics of aging, which may provide valuable insight into the mechanisms of cellular aging and eventually into the mechanisms of age-related diseases. The following two examples illustrate the kinds of extramural research to be emphasized:

- Indentification and characterization of genes that are expressed during senescence. Findings now being obtained in several laboratories indicate that some DNA sequences become undermethylated and others become rearranged as cells senesce. The degree of DNA methylation may influence gene expression and, therefore, may be indicative of changes in certain gene expressions with aging.

- Rearrangements of DNA sequences with aging. Several laboratories have obtained evidence that specific DNA sequences accumulate extra-chromosomally with aging. It has also been shown that the oncogene, Ha-ras, may undergo a four-fold amplification in the course of cellular senescence. Further studies are clearly needed to examine the nature of the observed gene amplification that occurs with aging.

An NIA intramural Laboratory of Molecular Genetics is being established. It will collaborate with other NIA intramural programs and focus on the following areas:

- Examination of the effect of aging on gene structure and the function of specific genes that may play important roles in aging processes, e.g., interleukin II.

- Identification, isolation, and characterization of genes that may be involved in the regulation of the rate of aging, e.g., genes involved in cellular senescence.

- Identification, isolation, and characterization of genes that may be involved in specific age-associated diseases, e.g., gene(s) for familial Alzheimer disease.

- Examination of the possible role of cellular proto-oncogenes in aging processes.

3. The Oldest Old

Until recently the segment of the population aged 85 and over has been relatively invisible, and Federal projections have consistently underestimated its growth. NIA researchers were among the first to alert the scientific community to the fact that this population has the most rapidly declining mortality rate of any age category and has been growing three times as fast as the population over age 65. By the year 2000, the numbers of persons in our country aged 85 and older will more than double, to 5.5 million. Despite the fact that they are substantial users of health care and other services (by one estimate, the Federal government spends about $50 billion annually in services and transfer payments), less is known about individuals in this age group than about any other. The best possible forecasts are needed of the size, nature, and needs of this population group. Major gaps in existing data must be filled, the quality of Federal statistics must be improved, and intensive studies of the problems and needs of the oldest individuals must be stimulated. Advanced methodologies are required for such studies, including more precise measurements of physiologic and pathophysiologic changes, methods of forecasting life expectancy and active life expectancy, models for projecting levels of dependency, and cohort analyses of probable future changes in the characteristics of the oldest old. Only through a major effort to assess this population now can adequate preparation be made for impending needs. Issues that must be addressed include:

- Describing and Forecasting. What are the current and what will be the future mortality, morbidity, and patterns of functioning among the population subgroups of the oldest old within the U.S. and other nations? What factors differentiate the "hardy and active" oldest old from others in terms of life style, medical and self-care, and genetic and familial background? One way to approach these issues is to use the new concept of active life expectancy defined as the expectancy for the number of years during which one maintains the ability to function independently. These and other aspects of forecasting methodologies need further development.

- Physiologic and Pathophysiologic Changes. Mortality rates continue to rise throughout the ninth and tenth decades of life. Many age-associated medical conditions, such as Alzheimer disease, urinary incontinence, and prostatic cancer, also appear to rise markedly in incidence. Physiologic changes during this part of the life span may contribute to increased risk for specific diseases and disabilities and increased mortality. However, most studies of human physiologic changes with age have included few subjects over 80 years old, and even fewer have selected representative samples of the overall population in this age category. Data on physiologic changes could increase understanding of factors predisposing to disease with high rates of onset in the ninth and tenth decades and of factors predisposing to increased mortality from various causes in the very elderly. Data are needed both on disease-free persons and on those with various chronic diseases of aging in order to understand the interactions among multiple disease processes in individual patients that occur so frequently in the oldest old.

- The Need for Care. More information is required about the availability of informal supports and living arrangements designed to keep the frail elderly in the community and about factors affecting institutionalization and use of formal services (e.g., dementia and other cognitive impairments; osteoarthritis and other causes of impaired mobility; falls and injuries; and incontinence). Similarly, improved data on the economic status of the oldest old are needed in order to understand their ability to obtain social services and health care and to investigate the impact of health care costs on the socioeconomic well-being of the very old (e.g., exhaustion of savings or "spending down" due to chronic illness).

4. Alzheimer Disease/Dementia/Neuroscience

Through both intramural and extramural mechanisms, the NIA has focused intensive research efforts on the physiology and psychology of normal brain aging and has developed a broad program of research on the epidemiology, etiology and pathogenesis, diagnosis, clinical course, and possible treatments of Alzheimer disease. Among the many age-related disabilities, those related to deficits in cognitive function have the most severe impact on the individual, the family, and social institutions. Between 5 and 10 percent of the 27 million Americans over age 65 suffer from serious cognitive deficits; more than half of these suffer from Alzheimer disease. The current annual cost of caring for some 2 million Alzheimer victims in the United States has been estimated to be $30 to $35 billion and is projected to reach $150 billion by the turn of the century. At the same time, there is a growing community of scientists interested in this problem. They know the appropriate questions to ask and have the tools to find the answers. In order to stress the urgency of these research needs, the U.S. Public Health Service has designated Alzheimer disease as a high priority public health issue. The NIA, in collaboration with the National Institute of Neurological and Communicative Disorders and Stroke, the National Institute of Mental Health, the National Institute of Allergy and Infectious Diseases, and other Federal agencies, continues to provide leadership in responding to this challenge. Highlights include the following activities:

- A program to establish a number of Alzheimer Disease Research Centers throughout the country was initiated in 1984 to support new research, to train scientists and health care professionals, and to disseminate information. Five centers were funded in 1984 and five more in FY 1985. These centers are coordinating basic, clinical, social, and behavioral studies on Alzheimer disease; pooling data on the clinical course of the disease in a large population; creating national standards for its diagnosis, and establishing a well-defined clinical population for future studies.

- NIA's intramural Laboratory of Neurosciences (LNS) has made significant contributions toward understanding the fundamental metabolic and chemical processes that underlie normal brain aging as compared with pathology in disease states. The LNS is carrying out a number of projects in this area, including 1) repetition of noninvasive studies to enable longitudinal assessment; 2) initiation of a clinical neuropathology and neurochemistry program to correlate in vivo findings with brain pathology and neurochemistry post mortem; 3) introduction of new diagnostic techniques and research tools in the established subject populations, including nuclear magnetic resonance and expanded applications of positron emission tomography; 4) placement of increasing emphasis on clinical pharmacology and pharmacokinetics; 5) increased utilization of applied mathematical biology and computerized approaches to data analysis and image processing, which includes a novel matrix approach devised by LNS scientists to examine functional interactions between brain regions; and 6) initiation of a new program effort in molecular biology of aging and dementia with both basic and clinical aspects.

- NIA's Epidemiology, Demography and Biometry Program is now completing a prevalence survey of mental illness in its New Haven population. Findings indicate that, for the noninstitutionalized population, rates of severe cognitive loss do not rise markedly until age 75 to 79, and then fully 17 percent of the noninstitutionalized elderly over 85 show severe cognitive impairment. Intensive studies of the natural history of cognitive impairment and its relationship to dementia as well as studies of various risk factors are underway in East Boston and in Framingham.

- The principal focus of the NIA's extramural Neuroscience of Aging program is on the basic mechanisms of the etiology and pathogenesis of Alzheimer disease. This program emphasizes studies on the nature of abnormal proteins found in neurofibrillary tangles; development of monoclonal antibodies to these proteins; the biochemistry of neurotransmitters, neuromodulators, and neuropeptides that may be affected in Alzheimer disease; and the role of brain enzymes involved in oxidative metabolism and neurotransmitter systems. Wtih regard to etiology, the program is fostering studies on infectious agents, toxins, and genetic factors. Studies on neural transplantation, neural trophic factors, and neural plasticity that have important implications for treatment of Alzheimer disease will continue to be emphasized. The way in which families and other social support systems affect and are affected by Alzheimer disease is also an important research issue for NIA.

- Because of its impact on the progress of research on dementia, increased emphasis is being placed on early and consistent diagnosis of Alzheimer disease. In 1983 a research planning workshop was jointly sponsored by the NIA, the American Association of Retired Persons, the National Institute of Neurological and Communicative Disorders and Stroke, and the National Institute of Mental Health. The purpose of the meeting was to identify the most important research opportunities and the crucial clinical and technical issues that influence the diagnosis of this disease. The proceedings provided the NIA and other sponsoring research institutes with valuable recommendations that have formed the basis for program development in the areas of longitudinal studies, diagnostic methods and markers, the use of the Down's syndrome model, familial-genetic investigations, autopsy criteria, information exchange, and continued research into the etiology and pathogenesis of the disease. This past July, the NIA collaborated with EURAGE and the World Health Organization, in conjunction with the XIII Congress of the International Association of Gerontology (IAG), to sponsor a planning meeting for the development of international standards and research criteria for the diagnosis of Alzheimer disease. These discussions, which were presented to the participants at the IAG, led to the recommendation that a diagnostic instrument be developed for testing by the participants and established the basis for many other multinational studies.

- A network of international collaboration is emerging in the area of Alzheimer disease. In addition to the IAG meeting to discuss international standards of diagnosis (mentioned above), the renewal of the Institute's World Health Organization Collaborating Center Agreement calls for the eventual development of an epidemiological center that will include studies on the dementias of later life. In time, neuropathology, brain banking, case registry, and patient diagnosis and evaluation activities may be developed within an NIA-supported center that will coordinate national and international efforts.

5. Strategies for Promoting Health and Effective Functioning

Few healthy individuals up to age 60, and less than half even at age 80, show reliable decrements in cognitive test performance. Among those 65 and over, only 5 percent are in nursing homes; and, while some 80 percent report having a chronic condition, fewer than 1 in 6 say they are thereby prevented from carrying on their normal activities. NIA-supported studies are beginning to show how even greater proportions of older people can maintain the vigor, health, and productivity of the middle years through research along the following lines:

- Health attitudes and behaviors. Behavioral geriatrics research is furthering knowledge of how health-related attitudes and behaviors of older people and their families and friends are acquired, affected by daily living, change as people grow older, and can be modified as both health-promoting and health-impairing behaviors are identified. How, then, do older individuals monitor their own bodily functioning? How do they define and interpret symptoms perceived as abnormal? Do they take remedial action? Do they utilize formal health care providers, as well as family members?

- Life style changes. Life style and behaviors have been implicated in more than half of the deaths in the U.S. However, research is required to specify the needed changes in nutrition, exercise, smoking, stress, and social support. For example, NIA's nutrition program aims to define the nutritional requirements for good health in older people; to determine how dietary deficiencies are associated with depressed immunocompetence, depressed cognitive function or overt metabolic disease; and to learn how eating behaviors change with aging. NIA is the lead institute in a seven-institute collaborative follow-up survey for the National Health and Nutrition Examination Survey I. This survey should provide key information concerning patterns of health and disease related to specific nutritional states.

In addition, NIA's exercise studies have shown that endurance-type training can result in beneficial outcomes for older people. Research is needed to assess the mechanisms through which acute exercise, and especially regular, long-term physical training, can prevent or ameliorate age-associated conditions, diseases, and disorders. The goal of such research is to define the extent to which the recommendation of exercise for older people, both healthy and disease-afflicted, is medically and physiologically sound.

o Productivity and independence in later years. Studies are needed to examine the factors implicated in the decline in labor force participation and reported reduction in productivity among older workers. Specifically, studies are needed to determine the relationship between self-reported health and early retirement. In addition, continuing research is needed in the human factors area to determine capabilities of older individuals for maintaining independent living outside of institutions.

o Cognitive functioning. NIA-supported studies are pointing to new dimensions of intellectual functioning (decision-making, judgment, wisdom), not currently measured in standard tests, that draw upon accumulated experience and may improve in middle and later life. Other studies are demonstrating how specific interventions can produce dramatic improvement among older people in numerous cognitive and related perceptual and neuropsychological processes that affect functioning.

6. Extending the Research Base in Geriatrics

In the past, a number of clinical problems of older people, such as incontinence, osteoarthritis, infectious disease, stroke, multi-infarct dementia, falls, and hip fractures, have received little research attention from the medical community although they represent major causes of chronic disability and institutionalization. Their prevention and treatment is possible through a better understanding of the underlying disease processes as well as through control of known precipitating factors such as falls, osteoporosis, and hypertension. These problems are now being addressed through support for clinical research in geriatrics in the NIA intramural program, in the NIA Teaching Nursing Home program, in collaboration with other institutes and agencies as well as through regular research grants and contracts. As a result, interest in clinical aging research is increasing within academic medicine, and the facilities and logistic support for this research have been significantly improved.

- Incontinence. Urinary incontinence may affect as much as 10 percent of the older population and significantly restrict activities in as many as 500,00 older Americans. As part of a behavioral medicine program designed to apply the principles and methods of behavioral sciences to the control of autonomic functions and the treatment of age-related medical disorders, NIA intramural scientists have operated an outpatient clinic for research on behavioral interventions to treat fecal and urinary incontinence in geriatric patients. An inpatient program has now been initiated to enable the further assessment of the techniques, their utility in a patient population typical of nursing home residents, and the capacity of nursing staff to administer them effectively. The Health Care Financing Administration has agreed to defray a substantial portion of the clinical costs of the program. In addition, over the past 4 years, the NIA has conducted several developmental activities in the area of urinary incontinence including two research workshops and a program announcement. Recently NIA, in collaboration with the Division of Nursing of the Health Resources and Services Administration, initiated five clinical trials of specific behavioral therapies for the major types of urinary incontinence that may afflict older people.

- Hip Fractures, Falls, and Osteoporosis. NIA has completed the first national study on age-specific incidence of hip fracture and has demonstrated an exponential rise among white females (the group in which three-fourths of the 200,000 hip fractures in the United States occur each year). The frequency in this group doubles every six years from about age 40 on. The median age for hip fracture is 79. Hip fractures have been found to be primarily associated with falls and increased bone loss due to osteoporosis. NIA, the National Institute of Arthritis, Diabetes, Digestive and Kidney Disease (NIADDK), and the NIH Office of Medical Applications recently cosponsored a consensus conference on the treatment of osteoporosis. A clinical trial aimed at promoting health practices that may minimize falls and hip fractures is being undertaken, with joint support by the Health Care Financing Administration and the Robert Wood Johnson Foundation, in an older population enrolled in a health maintenance organization. Also, in collaboration with NIADDK, NIA is planning to use the large elderly population screened for the systolic hypertension treatment trial to study the extent to which hip fractures in older persons can be prevented by treating osteoporosis. Falls in older people are associated with a number of risk factors, including gait and balance disorders, neuromuscular dysfunction, impaired vision and hearing, impaired mental function, and side effects of drugs. Some research on falls is already under way through support from NIA's Teaching Nursing Home grants. To stimulate more research in this area, NIA organized a comprehensive workshop that identified specific needs for research on important contributing factors. A request for applications was subsequently issued to invite proposals for research projects in this area.

- Collaboration with other Institutes. In addition to the activities described above, NIA and NIADDK are cosponsoring a workshop to develop new biochemical, cellular, biomechanical, and other research strategies for research on osteoarthritis. An NIA priority in this area is research to distinguish normal aging of articular cartilage and synovium from osteoarthritic changes. In collaboration with the National Heart, Lung, and Blood Institute, NIA is conducting a clinical trial on the treatment of isolated systolic hypertension (ISH) in older people. ISH is extremely common in this age group, and treatment could have a major impact on incidence of stroke, multi-infarct dementia, and other cardiovascular events. NIA and the National Institute of Allergy and Infectious Diseases held a joint planning workshop on research on infectious diseases in older people. NIA-supported research already undertaken in this expanding area includes epidemiologic studies in differing older populations, studies of the efficacies of prevention strategies such as pneumococcal vaccine for older people, and age-related changes in defense mechanisms against infections.

7. Effects of Gender on Health and Longevity

Many studies document, but few attempt to explain, the paradox that women report more illness and health care utilization than men, yet today life expectancy is consistently higher at every age for women than for men. This difference is not invariant, but has been increasing rapidly throughout the century. By the year 2000 there will be an estimated 150 women for every 100 men at age 65 and over, a ratio that will rise to 250 to 100 at age 85 and over. These changes create an opportunity for research on the sources of the gender differences in health and longevity and on the implications for the quality of life of older people of both sexes, their ability to function independently, and the societal costs entailed. The state of the science is now ready for such research. Longitudinal studies such as NIA's Baltimore Longitudinal Study of Aging have been recruiting women as well as men (although a larger representation of women is still required), and analytical techniques are now available for disentangling some of the gender differences from social, demographic, behavioral, and biological factors. Research is needed to weigh the contributions to health and longevity of associated gender differences in such factors as:

- Biological Aging Processess. What are the implications of the greater longevity of females observed in studies of animal species and of human fetal and neonatal mortality? To what extent do gender-specific genetic predispositions or hormonal mechanisms create an innate female advantage in survivorship and protection against degenerative disease? How do biological factors interact with environmental and behavioral factors to produce the marked temporal and geographical variations in the size of the gender differentials in health and longevity?

- Changing Character of Disease. With the shift in prevalence from acute to chronic diseases, why is it that death rates are higher for older males than for older females from such leading killers as heart disease, malignant neoplasms, influenza, and pneumonia (but not stroke or arteriosclerosis)? Why are women more vulnerable than men to such nonfatal ailments as arthritis, osteoporosis, sinusitis, varicose veins, and depression?

- Illness Behaviors and Attitudes. How do men and women differ in the way illness is perceived and the meaning it has, in response options and opportunities, in the social supports available, and in the long-term adaptive responses developed over a lifetime? How do women and men differ in symptom recognition, assessment of symptom severity, readiness to take curative or preventive health actions, and tendency to report symptoms that actually exist? As primary caregivers in family health matters, are women more knowledgeable about appropriate forms and sources of care? How do illness and self-care practices vary across the more- and less-developed nations (as suggested by a recent collaborative report issued by NIA and the World Health Organization)?

- Exposure to Health Risks. What changes are occurring in the patterns of exposure to hazards and in risk-taking behavior for women and men, particularly smoking, and how much do these differences contribute to changing differences in mortality and morbidity?

- Social Roles. How do the expectations and behaviors associated with gender roles affect health maintenance or result in differential exposure to health risk? How will women's health respond to the dual roles of homemaking and labor force participation and to the added role of caregiver to older persons who increasingly live entirely alone? How is living alone in the middle and later years related to nutrition, exercise, sociability, and to self-care vs. use of the health care system? Do the differing role experiences of women and men provide them with different health-related vulnerabilities and strengths?

Improved understanding of these gender differences can lead to decreased mortality and morbidity among both men and women. In addition, the impact of these differences on health care delivery, independent functioning, community and family structure, and societal costs needs to be better defined.

8. Enhancing Research Training and Career Development in Geriatrics and Gerontology

In 1984, the House Committee on Appropriations requested a report with a plan of action to improve and expand training in geriatrics and gerontology. The NIA provided leadership for this effort, which was organized through the establishment of a Task Force by the Secretary of Health and Human Services. The February 1984 Health and Human Services (HHS) "Report on Education and Training in Geriatrics and Gerontology" includes the work of the National Institute on Aging, the National Institute of Mental Health, the Administration on Aging, and the Health Resources and Services Administration, with representation from the Veterans Administration, the Department of Defense, and the Office of the Director, National Institutes of Health. The views of over 50 private agencies and professional organizations and 20 experts were considered in the study. The final report as endorsed by Congress estimated potential faculty needs for research and academic leadership throughout the health and human services professions. It outlined current Federal program efforts and provided innovative approaches for strengthening education and training activities.

The basic premises of the Task Force Report are that all students preparing for careers in health and other human services should receive education and experience about the aging process and the strengths and problems of the aged and that faculty for research and academic leadership in aging are essential. Current estimates from various sources indicate that we have no more than 10 percent of the needed personnel for teaching and research. The Report includes preliminary targets that call for a doubling to tripling of training and career development of health and human service professional school faculty now in order to reach reasonable goals by the year 2000, with the expectation that additional faculty will devote increasing efforts to research on aging.

In relation to this need, the National Institute on Aging has initiated several new training and manpower development mechanisms. The Geriatric Leadership Academic Award is designed to assist academic health centers and other health professional education institutions to enhance leadership and development of research and training activities in geriatrics by supporting a midlevel or senior faculty person to serve as the academic leader and coordinator. Two of these awards were funded in FY 1985, one at the University of Michigan and one at Case Western Reserve University.

A second mechanism, the Complementary Training Award for Research on Aging, assists institutions with strong, well-established research training programs in scientific fields relevant to aging to implement additional training programs for individuals who are interested in careers in aging-related research. One Complementary Award was funded at Stanford University in 1985.

In addition, the NIA is working with the other NIH Institutes to support training positions for research on aging on selected non-NIA institutional research training grants through supplementary funding of training positions in the existing programs. During FY 1985, the first year of this award's availability, 14 positions were funded--6 in demography, 1 in respiratory disease, 1 in cardiovascular epidemiology and prevention, and 6 in veterinary pathology.

These new programs have generated much interest and enthusiasm among academic health centers and directors of research training programs and are expected to enhance the present rate of NIA-supported training from 113 new persons per year to 210 if sufficient funds continue to be appropriated.

During the coming years, the National Institute on Aging will continue to provide leadership for meeting the objectives outlined in the HHS Task Force report through the development of training opportunities supported by its extramural and intramural research programs and through other efforts coordinated with the representatives of various federal agencies and the private sector.

Implementation

The NIA is responding to the challenges and opportunities described in the previous pages through a wide range of activities: grants for extramural research, training, and manpower development; research and development contracts; and research and training activities carried out in the intramural programs in Baltimore and Bethesda. In addition, the Institute's conferences and workshops, its participation in national and international activities, and its public information materials contribute to the attainment of these goals.

Detailed descriptions of activities conducted by the two major extramural research programs, Biomedical Research and Clinical Medicine (BRCM) and Behavioral Sciences Research (BSR), are presented in later sections of this book. A section is also included on the activities of the Epidemiology, Demography, and Biometry Program, an intramural research program that utilizes extramural contracts primarily for data collection. In addition, a brief description of the Intramural Research Program at the Gerontology Research Center in Baltimore and in the Clinical Center in Bethesda has been included this year, along with an organizational chart reflecting the new structure of this program. (Complete descriptions of intramural projects are published each year in the NIH Annual Report.) Important support functions are described under the Offices of Administrative Management, Extramural Affairs, and Public Information.

The figures and tables on the following pages provide an overview of funding activities at the NIA for the past several years.

Figure 1 shows that in FY 1985, as in previous years, the major portion (80%) of total Institute funds was used to support extramural activities in the form of research grants, training and fellowship awards, and research contracts and intra/interagency agreements. Approximately 14% of FY 1985 funds were spent on intramural research activities and 6% on operating and management costs, also shown in Figure 1.

The distribution of funds among research grant, training, and contract awards is compared in Figure 2, indicating a proportionately greater increase in the grants line in each of the past eight years. Of the $114 million in total extramural awards in FY 1985, 86% was spent on research grants while 10% was spent on contracts, and 4% on training.

Figure 3 shows a further breakdown of funds among the various mechanisms in the research grants category. The largest budget category is "Research Projects," in which the major portion of funds is awarded to project grants (R01s), along with a proportionately small number of other awards, and to research program projects (P01s), which include the Teaching Nursing Home Awards. In FY 1985, the second year in which the Alzheimer Disease Research Centers Award (P50) was available, five additional centers were funded for $3.4 million, bringing the total number of funded centers to ten. The remaining relatively small fraction of funds is in the "Other Research" and "Research Career Awards" categories.

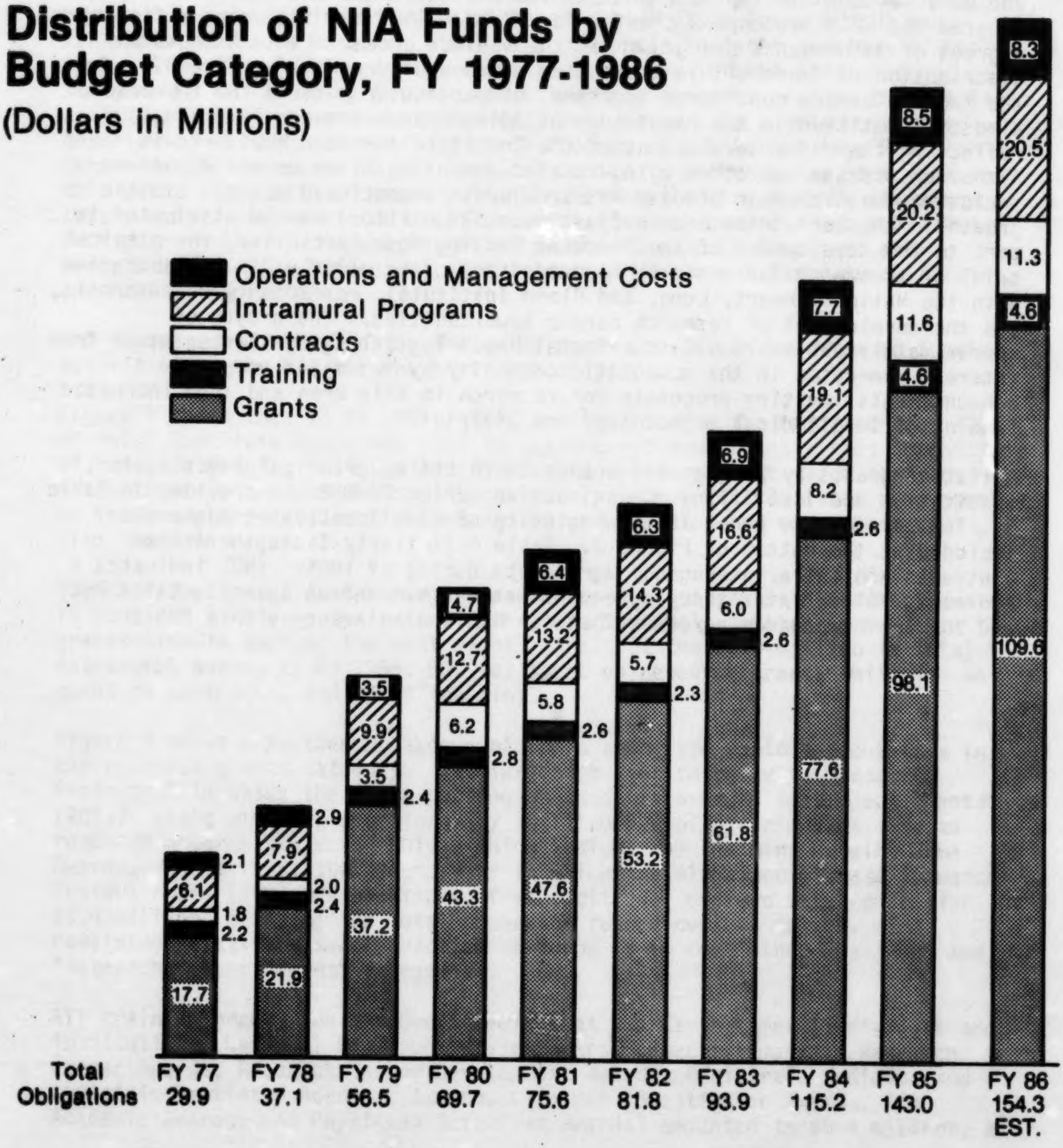
All training grants and manpower development awards together (individual and institutional National Research Service Awards, Special Emphasis Research Career Awards, Research Career Development Awards, Geriatric Medicine and Geriatric Dentistry Academic Awards, Clinical Investigator Awards, NIA Academic Awards, and Physician Scientist Awards) amounted to $9.4 million, a

$2.5 million increase over FY 1984 due to a Congressional increase in training funds under the FY 1985 appropriation (not shown in a figure).

The distribution of funds between the two extramural research programs, BRCM and BSR, is shown in Tables 1 and 2. Table 1 shows all extramural awards by program and BRCM branch/BSR cluster for FY 1978-1984 and indicates differing degrees of maintenance and growth in the various areas. Table 2 shows the distribution of funds within the entire extramural program for FY 1985. When the two tables are considered together, of particular note is the increase of almost $30 million in the Physiology of Aging Branch between 1978 and 1985, reflecting the major development of the Institute's research efforts in Alzheimer disease and other aging-related dementing diseases and disorders, including the Alzheimer Disease Research Centers mentioned above. Similar growth in the Geriatrics Branch (just over $25 million) can be attributed in part to the development of the Teaching Nursing Home initiative, the clinical trial of treatment for systolic hypertension in the elderly (in collaboration with the National Heart, Lung, and Blood Institute), research in osteoporosis, and the development of research career opportunities. The growth of approximately $11 million in the Social Psychological Aging Cluster stems from interest generated in the scientific community by two major program announcements inviting proposals for research in this area and from increased funding of longitudinal methodology and analyses.

A list of grants by program and branch (with title, principal investigator, institution and identifying number) active during FY 1985 is provided in Table 3. The key for the codes at the beginning of each identifying number is included at the bottom of Figure 3. Table 4 similarly lists the active contracts and intra/interagency agreements during FY 1985. (N01 indicates a contract, Y01 an interagency agreement between NIA and an agency outside PHS, and Y02 an intraagency agreement between NIA and an agency within PHS.)

Figure 1

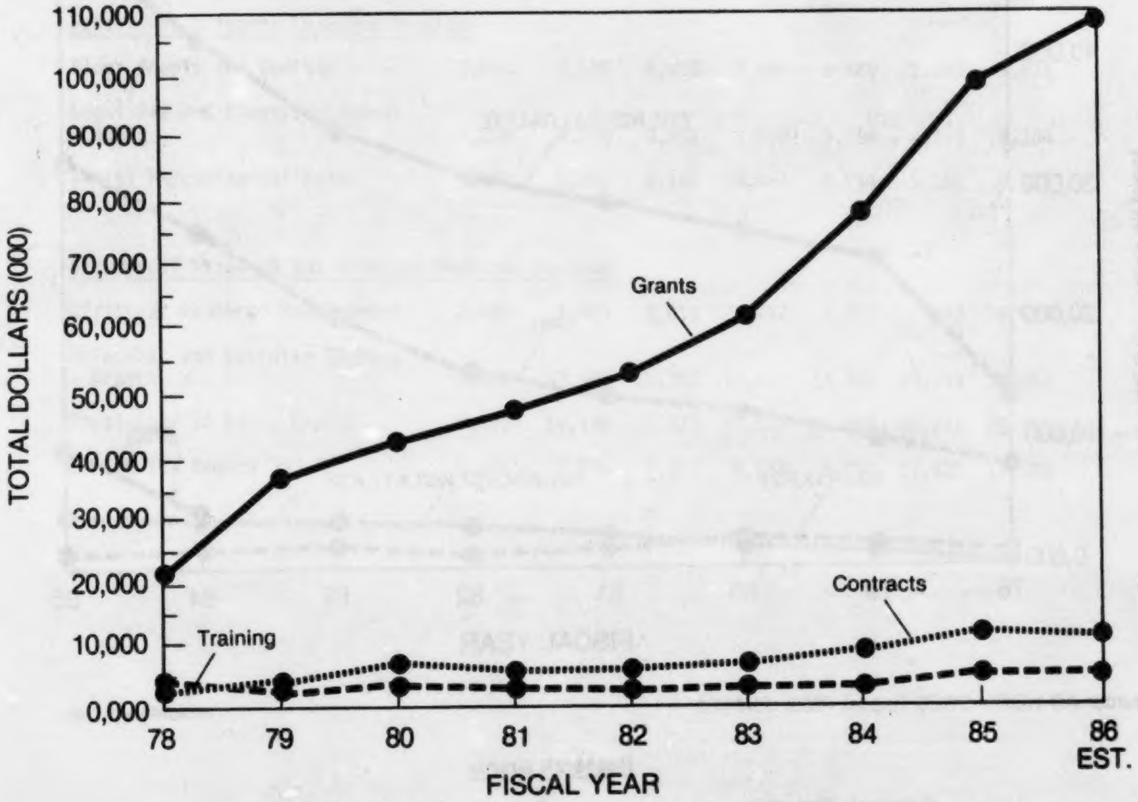


Source: NIA Budget Office, 11/85

PATIO/OPPA/NIA

Figure 2

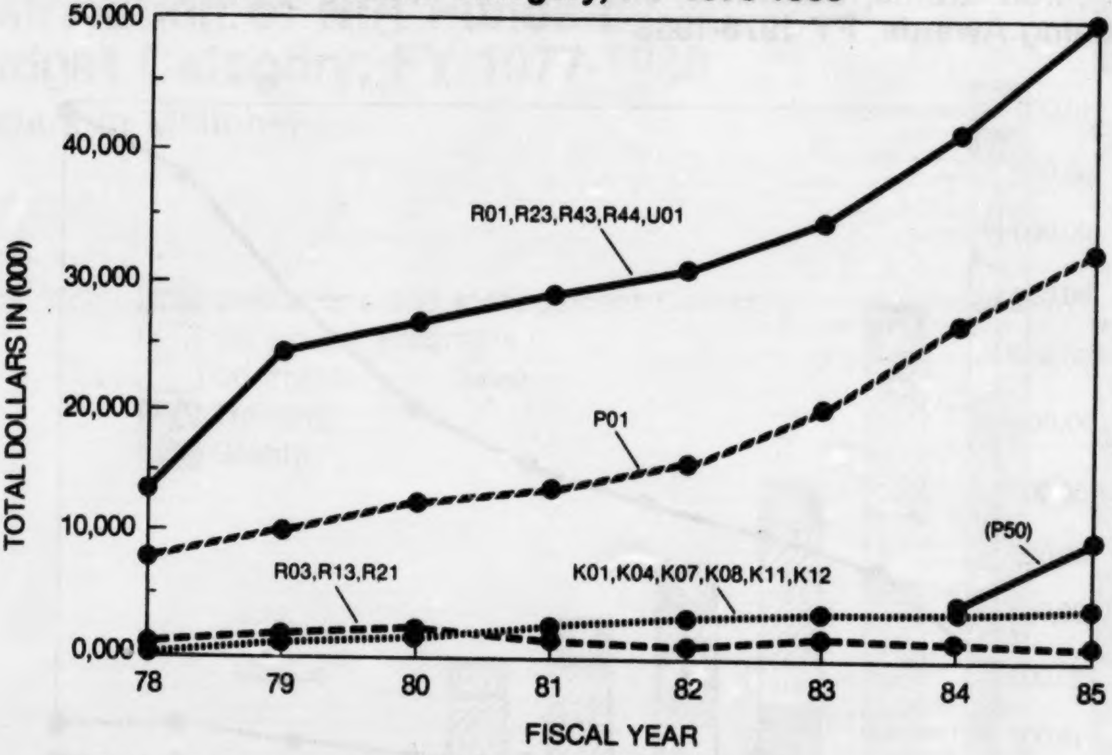
Trends in NIA Funding of Extramural Research Grants, Contracts, and Training Awards, FY 1978-1986



Source: Data Provided by the NIA Budget Office 11/85

PATIO/OPPA/NIA

Figure 3



Distribution of Funds in the Research Grants Category, FY 1978-1985

Source: AD HOC ADRES Report P029, 11/14/85

PAO/OPPA/NIA 11/85

Research Grants

Research Projects:
- R01 - Project Grants
- P01 - Research Program Projects (Includes Teaching Nursing Home Awards)
- R23 - New Investigator Awards
- R43 - Small Business Innovation Research Awards, Phase I
- R44 - Small Business Innovation Research Awards, Phase II
- U01 - Research Projects (Cooperative Agreements)

Program Centers:
- P50 - Alzheimer Disease Research Centers

Other Research:
- R03 - Small Grants
- R13 - Conference Grants
- R21 - Special Initiative Awards

Research Career Awards:
- K01 - Special Emphasis Research Career Awards
- K04 - Research Career Development Awards
- K07 - Geriatric Medicine Academic Awards
- K07 - Geriatric Dentistry Academic Awards
- K08 - Clinical Investigator Awards
- K08 - NIA Academic Awards
- K11 - Physician Scientist Awards (Individual)
- K12 - Physician Scientist Awards (Institutional)

Table 1

NIA Extramural Research Grants, Training Awards, Research Contracts and Intra/Interagency Agreements, by Program and Branch/Cluster, FY 1978-1984

(dollars in thousands)

	1978	1979	1980	1981	1982	1983	1984
Behavioral Sciences Research Program							
Older People and Society	2,666	3,625	4,035	3,896	3,725	3,602	3,875
Cognitive and Biopsychological Aging	3,206	4,050	3,851	3,579	3,784	4,199	5,184
Social Psychological Aging	901	1,451	2,161	2,043	2,944	5,184	8,587
Biomedical Research and Clinical Medicine Program							
Office of Resource Development	1,400	1,853	2,013	1,437	1,811	649	1,029
Molecular and Cellular Biology Branch	7,615	12,966	13,203	14,047	14,265	14,736	15,380
Physiology of Aging Branch	8,777	14,170	17,573	20,626	21,953	24,173	29,421
Geriatrics Branch	1,586	3,495	4,657	5,168	8,011	11,427	19,286

11/22/85

Table 2

NIA Extramural Research Grants, Training Awards, Research Contracts, and Intra/Interagency Agreements, Detailed Breakdown, FY 1985

		(dollars in thousands)
Behavioral Sciences Research (BSR) Program		
Older People and Society		5,731
Cognitive and Biopsychological Aging		5,745
Social Psychological Aging		12,807
	Total BSR	24,283
Biomedical Research and Clinical Medicine (BRCM) Program		
Office of Resource Development		
Animal Models (Contracts Only)		2,787
Molecular and Cellular Biology Branch		
Animal Models (Research Grants Only)		274
Cell Biology		8,688
Genetics		4,354
Molecular Biology		3,806
Others		110
	Subtotal	17,232
Physiology of Aging Branch		
Exercise Physiology		2,840
Immunology		7,009
Neuroscience		27,376 a/
	Subtotal	37,225
Geriatrics Branch		
Cardiovascular/Pulmonary/Renal Research		5,480 b/
Endocrinology		3,320
Genitourinary Disorders		2,908
Geriatric Research and Training		8,918
Infections/Hematology/Oncology		2,037
Musculoskeletal Research		2,897
Nutrition/Metabolism/Gastroenterology		1,940
	Subtotal	27,500
	Total BRCM	84,744
Intramural Research Program		
Research Contracts and Intra/Interagency Agreements (funded from the extramural research contract line)		3,773
Scientific Review and Evaluation (U09)		500
Joint Funding Activities (Uncoded)		1,023
	Total Extramural Research, All Programs	114,323

a/ Includes funds of $8.6 million for Alzheimer Disease Research Centers.
b/ Includes funds of $4 million for clinical trial of treatment for Systolic Hypertension in the Elderly Program (SHEP).

Source: NIA Report GM11 11/8/85 PATIO/OPPA/NIA 11/20/85

Table 3

NATIONAL INSTITUTE ON AGING
ACTIVE RESEARCH AND TRAINING GRANTS

BIOMEDICAL RESEARCH AND CLINICAL MEDICAL

MOLECULAR AND CELLULAR BIOLOGY BRANCH

SECTION: ANIMAL MODELS

ALLEY, CHARLES D 1 R03 AG05486
AGING AND THE RESPONSE TO INGESTED ANTIGEN
UNIVERSITY OF ALABAMA AT BIRMINGHAM
BIRMINGHAM ALABAMA

COLLINS, DELWOOD C 1 R03 AG05838
PRIMATE MODEL FOR NON-INSULIN DEPENDENT DIABETES
UNIVERSITY OF PUERTO RICO MED SCIENCES
SAN JUAN PUERTO RICO

EICHBERG, JORG W 1 R03 AG05835
CELLULAR IMMUNOCOMPETENCE OF THE AGING CHIMPANZEE
SOUTHWEST FOUNDATION FOR BIOMEDICAL RES
SAN ANTONIO TEXAS

GERALL, ARNOLD A 1 R03 AG05543
INVESTIGATING NEURAL AND REPRODUCTIVE AGING PROCESSES
TULANE UNIVERSITY OF LOUISIANA
NEW ORLEANS LOUISIANA

HOFFMAN, DOUGLAS W 1 R03 AG05499
AGE RELATED CHANGES IN AUDITORY NEUROTRANSMITTERS
SOUTHERN ILLINOIS UNIVERSITY SCH OF MED
SPRINGFIELD ILLINOIS

KALU, DIKE N 1 R03 AG05536
MODEL OF OVARIAN DEFICIENCY BONE LOSS
UNIVERSITY OF TEXAS HLTH SCI CTR SAN ANT
SAN ANTONIO TEXAS

LEWIS, ROBERT M 5 T32 AG00104
TRAINING VETERINARY PATHOLOGISTS FOR AGING RESEARCH
CORNELL UNIVERSITY ITHACA
ITHACA NEW YORK

ROTH, JAMES A 1 R03 AG05517
SOMATOTROPIN INFLUENCE ON THE THYMUS IN AGING
IOWA STATE UNIVERSITY OF SCIENCE & TECH
AMES IOWA

SECTION: CELL BIOLOGY

ALLEN, RONALD E 5 R01 AG03393
CHANGES IN SKELETAL MUSCLE SATELLITE CELLS DURING AGING
UNIVERSITY OF ARIZONA
TUCSON ARIZONA

AMENTA, JOSEPH S 5 R01 AG03346
PATHOPHYSIOLOGY OF CELLULAR SENESCENCE
UNIVERSITY OF PITTSBURGH
PITTSBURGH PENNSYLVANIA

BIERMAN, EDWIN L 5 R01 AG02673
AGING AND METABOLISM OF CULTURED HUMAN ARTERIAL CELLS
UNIVERSITY OF WASHINGTON
SEATTLE WASHINGTON

BRAVERMAN, IRWIN M 2 T32 AG00081
BIOLOGY OF CUTANEOUS AGING
YALE UNIVERSITY
NEW HAVEN CONNECTICUT

CAPLAN, ARNOLD I 5 P01 AG02921
EXTRACELLULAR MATRIX AND AGING
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

CAPLAN, ARNOLD I 3 T32 AG00105
CELL AND MOLECULAR AGING TRAINING GRANT
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

CHEE, DARWIN O 1 R43 AG06273
LIPID INCORPORATED SERUM-FREE MEDIUM
ONCOLOGY LABORATORIES, INC.
WEST WARWICK RHODE ISLAND

CHEN, KUANG YU 5 R01 AG03578
ROLE OF POLYAMINES IN CELLULAR AGING
RUTGERS THE STATE UNIV NEW BRUNSWICK
NEW BRUNSWICK NEW JERSEY

CRISTOFALO, VINCENT J 3 P01 AG00378
CELLULAR SENESCENCE AND CONTROL OF CELL PROLIFERATION
WISTAR INSTITUTE OF ANATOMY AND BIOLOGY
PHILADELPHIA PENNSYLVANIA

DANIEL, CHARLES W 2 R01 AG01050
AGING OF MOUSE MAMMARY CELLS
UNIVERSITY OF CALIFORNIA SANTA CRUZ
SANTA CRUZ CALIFORNIA

DICE, JAMES F, JR 7 K04 AG00339
PROTEIN DEGRADATION IN AGING HUMAN FIBROBLASTS
TUFTS UNIVERSITY
BOSTON MASSACHUSETTS

DICE, JAMES F, JR 7 R01 AG06116
PROTEIN DEGRADATION IN AGING HUMAN FIBROBLASTS
TUFTS UNIVERSITY
BOSTON MASSACHUSETTS

GALLOP, PAUL M 5 P01 AG04727
AGING CELL AND TISSUES
CHILDREN'S HOSPITAL (BOSTON)
BOSTON MASSACHUSETTS

GOLDHABER, PAUL 5 R01 AG02899
EFFECT OF AGE ON BONE REMODELING IN VITRO AND IN VIVO
HARVARD UNIVERSITY
BOSTON MASSACHUSETTS

GOLDMAN, ROBERT D 5 R01 AG03258
CYTOSKELETAL CHANGES DURING AGING OF CELL CULTURES
NORTHWESTERN UNIVERSITY
CHICAGO ILLINOIS

GRACY, ROBERT W 5 R01 AG01274
THE EFFECTS OF AGING ON LYMPHOCYTE ACTIVATION
NORTH TEXAS STATE UNIVERSITY
DENTON TEXAS

GRESIK, EDWARD W 5 R01 AG03508
AGING IN SUBMANDIBULAR CELLS MAKING GROWTH FACTORS
MOUNT SINAI SCHOOL OF MEDICINE
NEW YORK NEW YORK

LEVER, JULIA E 5 R01 AG04711
DIFFERENTIATION OF RENAL EPITHELIAL CELLS IN CULTURE
UNIVERSITY OF TEXAS HLTH SCI CTR HOUSTON
HOUSTON TEXAS

LEVINE, ELLIOT M 5 R01 AG00839
CELLULAR GROWTH AND SENESCENCE IN ENDOTHELIAL CELLS
WISTAR INSTITUTE OF ANATOMY AND BIOLOGY
PHILADELPHIA PENNSYLVANIA

LIPSCHITZ, DAVID A 5 R01 AG02603
HEMATOPOIESIS AND AGING
UNIVERSITY OF ARKANSAS MED SCIS LTL ROCK
LITTLE ROCK ARKANSAS

MACIAG, THOMAS 5 R01 AG04807
HUMAN ENDOTHELIAL CELL ORGANIZATION INFLUENCE
MELOY LABORATORIES, INC.
SPRINGFIELD VIRGINIA

MARTIN, GEORGE M 5 P01 AG01751
GENE ACTION IN THE PATHOBIOLOGY OF AGING
UNIVERSITY OF WASHINGTON
SEATTLE WASHINGTON

MARTIN, GEORGE M 5 T32 AG00057
GENETIC APPROACHES TO AGING RESEARCH
UNIVERSITY OF WASHINGTON
SEATTLE WASHINGTON

MC KEEHAN, WALLACE L 5 T32 AG00095
CELLULAR AGING--RELATION OF IN VITRO TO IN VIVO AGING
W. ALTON JONES CELL SCIENCE CENTER
LAKE PLACID NEW YORK

MILLIS, ALBERT J 5 R01 AG00697
SURFACE PROTEINS AND CELLULAR SENESCENCE
STATE UNIVERSITY OF NEW YORK AT ALBANY
ALBANY NEW YORK

NIMNI, MARCEL E 2 R01 AG02577
OSTEOGENESIS: DEVELOPMENT, MODULATION, AND AGING
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES CALIFORNIA

OZER, HARVEY L 5 R01 AG04821
IMMORTALIZATION OF SV40-TRANSFORMED HUMAN CELLS
HUNTER COLLEGE
NEW YORK NEW YORK

PHILLIPS, PHILIP G 1 R43 AG06281
SPONGE MATRICES FOR CONTINUOUS FIBROBLAST CULTURE
VERAX CORPORATION
HANOVER NEW HAMPSHIRE

POLGAR, PETER R 5 R01 AG05007
IN VIVO CELLULAR AGING OF THE AORTA
BOSTON UNIVERSITY
BOSTON MASSACHUSETTS

POOL, THOMAS B 5 K04 AG00210
GROWTH ARREST DURING CELLULAR AGING IN VITRO
UNIVERSITY OF TEXAS HLTH SCI CTR SAN ANT
SAN ANTONIO TEXAS

POOL, THOMAS B 5 R01 AG03829
COMPARTMENTS OF GROWTH ARREST DURING CELLULAR AGING
UNIVERSITY OF TEXAS HLTH SCI CTR SAN ANT
SAN ANTONIO TEXAS

RHEINWALD, JAMES G 2 R01 AG02048
SENESCENCE AND DIFFERENTIATION IN CULTURED EPITHELIA
DANA-FARBER CANCER INSTITUTE
BOSTON MASSACHUSETTS

SABATINI, DAVID D 2 R01 AG01461
SYNTHESIS AND DISTRIBUTION OF PROTEINS IN MEMBRANES
NEW YORK UNIVERSITY
NEW YORK NEW YORK

SCHWARTZ, ARTHUR G 5 T32 AG00097
CELLULAR AND MOLECULAR ASPECTS OF AGING
TEMPLE UNIVERSITY
PHILADELPHIA PENNSYLVANIA

SEIFTER, SAM 1 P01 AG05554
STRUCTURE AND FUNCTION IN DEVELOPING AND AGING HEARTS
YESHIVA UNIVERSITY
NEW YORK NEW YORK

SMITH, JAMES R 2 R01 AG04749
SENESCENCE FACTOR IDENTITY: PROTEIN MRNA & GENOMIC DNA
BAYLOR COLLEGE OF MEDICINE
HOUSTON TEXAS

STEIN, GRETCHEN H 5 R01 AG00947
GROWTH REGULATION: SENESCENT VS NONSENESCENT CELLS
UNIVERSITY OF COLORADO AT BOULDER
BOULDER COLORADO

STEIN, GRETCHEN H 5 R01 AG04811
CONTROL OF CELL PROLIFERATION IN HUMAN CELLS
UNIVERSITY OF COLORADO AT BOULDER
BOULDER COLORADO

STOCKDALE, FRANK E 5 R01 AG02822
DEVELOPMENTAL AGE AND CHANGES IN MYOSIN ISOZYMES
STANFORD UNIVERSITY
STANFORD CALIFORNIA

THONAR, EUGENE J-M 5 R01 AG04736
AGE-RELATED DIFFERENCES IN CARTILAGE PROTEOGLYCANS
RUSH-PRESBYTERIAN-ST LUKES MEDICAL CTR
CHICAGO ILLINOIS

VOGEL, KATHRYN G 5 K04 AG00114
GLYCOSAMINOGLYCANS OF THE AGING CELL
UNIVERSITY OF NEW MEXICO ALBUQUERQUE
ALBUQUERQUE NEW MEXICO

VORBECK, MARIE L 5 R01 AG00590
MITOCHONDRIAL STRUCTURE AND FUNCTION IN AGING
UNIVERSITY OF MISSOURI COLUMBIA
COLUMBIA MISSOURI

WANG, YU-HWA E 2 R01 AG03020
CYTOSKELETAL STRUCTURE IN AGING FIBROBLASTS
ROCKEFELLER UNIVERSITY
NEW YORK NEW YORK

WRIGHT, BARBARA E 2 R01 AG03884
COMPUTER ANALYSIS OF AGING IN DICTYOSTELIUM
UNIVERSITY OF MONTANA
MISSOULA MONTANA

WRIGHT, WOODRING E 5 R01 AG01228
GENE EXPRESSION IN AGING AND DEVELOPMENT
UNIVERSITY OF TEXAS HLTH SCI CTR DALLAS
DALLAS TEXAS

YEE, JOHN A 2 R01 AG02731
IN VITRO STUDIES ON ISOLATED ENDOSTEAL BONE CELLS
TEXAS TECH UNIVERSITY
LUBBOCK TEXAS

SECTION: GENETICS

AUFDERHEIDE, KARL J 5 R01 AG02657
NUCLEO-CYTOPLASMIC INTERACTIONS IN AGED PARAMECIA
TEXAS AGRI AND MECH UNIV COLLEGE STATION
COLLEGE STATION TEXAS

BEDFORD, J MICHAEL 5 R01 AG02947
IMPLICATIONS OF SPERM AGING IN THE MALE OR FEMALE TRACT
CORNELL UNIVERSITY MEDICAL CENTER
NEW YORK NEW YORK

BEWLEY, GLENN C 5 R01 AG01739
GENETIC CONTROL OF THE SYNTHESIS OF CATALASE
NORTH CAROLINA STATE UNIVERSITY RALEIGH
RALEIGH NORTH CAROLINA

BRAVERMAN, IRWIN M 2 R01 AG03295
ROLE OF ELASTIC FIBERS AND VESSELS IN CUTANEOUS AGING
YALE UNIVERSITY
NEW HAVEN CONNECTICUT

CASKEY, CHARLES T 1 R13 AG06098
FASEB SUMMER RESEARCH CONFERENCE: SOMATIC CELL GENETICS
FEDERATION OF AMER SOC FOR EXPER BIO
BETHESDA MARYLAND

EAVES, LINDON J 5 R01 AG04954
GENETIC MODELS OF DEVELOPMENT AND AGING
VIRGINIA COMMONWEALTH UNIVERSITY
RICHMOND VIRGINIA

EPSTEIN, HENRY F 5 R01 AG01302
THE MOLECULAR BASIS OF NEUROMUSCULAR DEVELOPMENT
BAYLOR COLLEGE OF MEDICINE
HOUSTON TEXAS

GOLDSTEIN, SAMUEL 3 R01 AG03314
GENETIC ORGANIZATION AND EXPRESSION IN AGING FIBROBLASTS
UNIVERSITY OF ARKANSAS MED SCIS LTL ROCK
LITTLE ROCK ARKANSAS

GRODZICKER, TERRI I 1 R13 AG05326
C. ELEGANS MEETINGS
COLD SPRING HARBOR LABORATORY
COLD SPRING HARBO NEW YORK

HARTMAN, PHILIP S 2 R01 AG03161
DNA REPAIR IN THE NEMATODE CAENORHABDITIS ELEGANS
TEXAS CHRISTIAN UNIVERSITY
FORT WORTH TEXAS

HIRAIZUMI, YUICHIRO 2 R01 AG01934
GENETICS OF REPRODUCTIVE LONGEVITY IN DROSOPHILA
UNIVERSITY OF TEXAS AUSTIN
AUSTIN TEXAS

HUANG, RU-CHIH C 5 R01 AG04350
ACTIVATION OF A TYPE VIRAL GENE EXPRESSION DURING AGING
JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

JACOBSON, LEWIS A 5 R01 AG02655
LYSOSMAL PROTEASES, PROTEIN TURNOVER AND AGING
UNIVERSITY OF PITTSBURGH
PITTSBURGH PENNSYLVANIA

JOHNSON, THOMAS E 1 R01 AG05720
GENETIC SPECIFICATION AT PHYSIOLOGICAL AGING
UNIVERSITY OF CALIFORNIA IRVINE
IRVINE CALIFORNIA

KORNBERG, ARTHUR 5 P01 AG02908
DNA TRANSACTIONS AND AGING
STANFORD UNIVERSITY
STANFORD CALIFORNIA

LANE, ROGER S 5 R01 AG01002
PROTEIN TURNOVER AND AGING
UNIVERSITY OF SOUTH ALABAMA
MOBILE ALABAMA

MACINTYRE, ROSS J 5 R01 AG01811
MUTANTS AT THE 2-GLYCEROPHOSPHATE DEHYDROGENASE LOCUS
CORNELL UNIVERSITY ITHACA
ITHACA NEW YORK

PARKENING, TERRY A 1 R01 AG04753
EFFECTS OF PATERNAL AGE ON REPRODUCTION
UNIVERSITY OF TEXAS MED BR GALVESTON
GALVESTON TEXAS

PATTERSON, DAVID 5 R01 AG00029
GENE EXPRESSION IN SOMATIC CELLS IN THE AGING PROCESS
UNIVERSITY OF COLORADO HLTH SCIENCES CTR
DENVER COLORADO

PEREIRA-SMITH, OLIVIA M 1 R01 AG05333
A GENETIC ANALYSIS OF INDEFINITE DIVISION IN HUMAN CELLS
BAYLOR COLLEGE OF MEDICINE
HOUSTON TEXAS

PUSTELL, JAMES M 1 R43 AG06269
SOFTWARE FOR NUCLEIC ACID AND PROTEIN SEQUENCE ANALYSIS
INTERNATIONAL BIOTECHNOLOGIES, INC.
NEW HAVEN CONNECTICUT

REEVE, JOHN N 5 K04 AG00108
ENZYME AGING AND GENE EXPRESSION IN ANUCLEATE CELLS
OHIO STATE UNIVERSITY
COLUMBUS OHIO

RICHARDSON, ARLAN G 1 R01 AG04520
EFFECT OF AGING ON GENE EXPRESSION
ILLINOIS STATE UNIVERSITY
NORMAL ILLINOIS

RICHMOND, ROLLIN C 5 R01 AG02035
MECHANISM OF FERTILITY LOSS IN AGING DROSOPHILA MALES
INDIANA UNIVERSITY BLOOMINGTON
BLOOMINGTON INDIANA

RIPLEY, LYNN S 1 R01 AG06171
MOLECULAR MECHANISMS OF SPONTANEOUS MUTAGENESIS
UNIVERSITY OF MEDICINE & DENTISTRY OF NJ
NEWARK NEW JERSEY

RIZKI, TAHIR M 5 R01 AG01945
DEVELOPMENTAL GENETICS OF ADIPOSE CELLS IN DROSOPHILA
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

ROACH, DEBORAH A 1 F32 AG05376
THEORETICAL POPULATION GENETICS OF SENESCENCE
DUKE UNIVERSITY
DURHAM NORTH CAROLINA

ROTHSTEIN, MORTON 3 R01 AG00618
AGE-RELATED ALTERATION OF ENZYMES
STATE UNIVERSITY OF NEW YORK AT BUFFALO
BUFFALO NEW YORK

RUSSELL, RICHARD L 2 R01 AG01154
GENETIC, BIOCHEMICAL AND DIETARY PROBES OF AGING
UNIVERSITY OF PITTSBURGH
PITTSBURGH PENNSYLVANIA

RUTHERFORD, CHARLES L 3 R01 AG00677
ALTERNATE PATHWAYS IN CELLULAR AGING
VIRGINIA POLYTECHNIC INST AND ST UNIV
BLACKSBURG VIRGINIA

SCHIMKE, ROBERT T 1 P01 AG05568
GENOME EVOLUTION/REGULATION OF PROTEIN LEVELS IN AGING
STANFORD UNIVERSITY
STANFORD CALIFORNIA

SHEARN, ALLEN D 2 R01 AG01822
MUTATIONAL DISSECTION OF IMAGINAL DISC DEVELOPMENT
JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

STROHMAN, RICHARD C 2 R01 AG02832
MUSCLE MATURATION: IMPACT OF NEURONS, ACTIVITY, AGING
UNIVERSITY OF CALIFORNIA BERKELEY
BERKELEY CALIFORNIA

TEMPLETON, ALAN R 5 R01 AG02246
THE AGING EFFECTS ASSOCIATED WITH A POLYGENIC COMPLEX
WASHINGTON UNIVERSITY
SAINT LOUIS MISSOURI

VOGEL, KATHRYN G 1 R01 AG05582
FIBROBLAST PROTEOGLYCANS AND CONNECTIVE TISSUE MATRIX
UNIVERSITY OF NEW MEXICO ALBUQUERQUE
ALBUQUERQUE NEW MEXICO

SECTION: MOLECULAR BIOLOGY

ALLEN, ROBERT G 1 F32 AG05346
EFFECTS OF OXIDATIVE STRESS IN CULTURED FIBROBLASTS
ROCKEFELLER UNIVERSITY
NEW YORK NEW YORK

BALDWIN, THOMAS O 5 R01 AG03697
THE MECHANISM OF ENZYME MODIFICATION-DEGRADATION
TEXAS AGRI AND MECH UNIV COLLEGE STATION
COLLEGE STATION TEXAS

BALIN, ARTHUR K 1 K08 AG00282
DOES OXIDATIVE DAMAGE CONTRIBUTE TO THE AGING PROCESS
ROCKEFELLER UNIVERSITY
NEW YORK NEW YORK

BALIN, ARTHUR K 1 R01 AG04993
DOES OXIDATIVE DAMAGE CONTRIBUTE TO THE AGING PROCESS
ROCKEFELLER UNIVERSITY
NEW YORK NEW YORK

CHEDEKEL, MILES R 5 K04 AG00129
PHOTOCHEMISTRY AND PHOTOBIOLOGY OF PHEOMELANIN
JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

CHEDEKEL, MILES R 3 R01 AG02381
BIOSYNTHESIS AND STRUCTURE OF PHAEOMELANIN
JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

COOL, BARBARA L 1 F32 AG05368
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FELDMAN, MARTIN L 5 R01 AG03574
EXPERIMENTAL ANATOMICAL STUDIES IN PRESBYCUSIS
BOSTON UNIVERSITY
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FIFKOVA, EVA 5 R01 AG04804
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UNIVERSITY OF SOUTHERN CALIFORNIA
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FINE, RICHARD E 9 R01 AG05894
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FLOOD, JAMES F 1 R01 AG04939
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FREEMAN, GARY B 5 F32 AG05352
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BURKE REHABILITATION CTR (WHITE PLNS,NY)
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FRIEDRICH, FRANCES J 1 R03 AG05763
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UNIVERSITY OF CALIFORNIA DAVIS
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WAYNE STATE UNIVERSITY
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GHETTI, BERNARDINO 1 R03 AG05563
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INDIANA UNIV-PURDUE UNIV AT INDIANAPOLIS
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GIBSON, GARY E 5 R01 AG04171
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BURKE REHABILITATION CTR (WHITE PLNS,NY)
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GLENNER, GEORGE G 1 R01 AG05683
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UNIVERSITY OF CALIFORNIA SAN DIEGO
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GREEN, EDWARD J 1 F32 AG05345
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GRIFFIN, WILMA S 1 R01 AG05537
ALTERED GENE EXPRESSION IN ALZHEIMER SENILE DEMENTIA
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GRIFFITH, WILLIAM H, III 1 R03 AG05282
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TEXAS AGRI AND MECH UNIV COLLEGE STATION
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GROWDON, JOHN H 5 P50 AG05134
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HARVARD UNIVERSITY
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GROWDON, JOHN H 5 R01 AG04512
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MASSACHUSETTS GENERAL HOSPITAL
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HALSEY, JAMES H, JR 5 R01 AG05014
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UNIVERSITY OF ALABAMA AT BIRMINGHAM
BIRMINGHAM ALABAMA

HEIMANN, RUTH 5 F32 AG05330
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NEW YORK UNIVERSITY
NEW YORK NEW YORK

HENDRIE, HUGH C 1 R03 AG05564
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INDIANA UNIV-PURDUE UNIV AT INDIANAPOLIS
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HIRSCH, BETSY A 1 R03 AG04849
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UNIVERSITY OF MINNESOTA OF MNPLS-ST PAUL
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MERCY HOSPITAL AND MED CTR (CHICAGO)
CHICAGO ILLINOIS

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UNIVERSITY OF PITTSBURGH
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GRADUATE HOSPITAL (PHILADELPHIA)
PHILADELPHIA PENNSYLVANIA

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY
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NEW YORK   NEW YORK

IYER, VASKUDEVA   1 R03 AG05771
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UNIVERSITY OF LOUISVILLE
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JOACHIM, CATHERINE L   1 F32 AG05360
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BRIGHAM AND WOMEN'S HOSPITAL
BOSTON   MASSACHUSETTS

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PATHOGENESIS OF SENILE DEMENTIA AND CEREBRAL AGING
YESHIVA UNIVERSITY
NEW YORK   NEW YORK

JOHNSON, ANNE B   1 R03 AG05501
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JONES, ERVIN E   1 R01 AG05004
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YALE UNIVERSITY
NEW HAVEN   CONNECTICUT

JOPE, RICHARD S   1 R01 AG04719
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UNIVERSITY OF ALABAMA AT BIRMINGHAM
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JOYNT, ROBERT J   5 P01 AG03644
CLINICOPATHOLOGIC CORRELATES OF ALZHEIMER'S DISEASE
UNIVERSITY OF ROCHESTER
ROCHESTER   NEW YORK

KATZMAN, ROBERT   5 P50 AG05131
ALZHEIMER'S DISEASE RESEARCH CENTER
UNIVERSITY OF CALIFORNIA SAN DIEGO
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KING, JOAN C   1 R03 AG05839
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TUFTS UNIVERSITY
BOSTON   MASSACHUSETTS

KOSIK, KENNETH S   7 R01 AG06172
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BRIGHAM AND WOMEN'S HOSPITAL
BOSTON   MASSACHUSETTS

KRIPKE, DANIEL F   2 R01 AG02711
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UNIVERSITY OF CALIFORNIA SAN DIEGO
LA JOLLA   CALIFORNIA

LANDFIELD, PHILIP W   5 R01 AG04542
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WINSTON-SALEM   NORTH CAROLINA

LASEK, RAYMOND J   2 P01 AG00795
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CASE WESTERN RESERVE UNIVERSITY
CLEVELAND   OHIO

LEE, CHAO-HUNG 1 R03 AG05310
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INDIANA UNIV-PURDUE UNIV AT INDIANAPOLIS
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LEVINE, MICHAEL S 5 R01 AG01558
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UNIVERSITY OF CALIFORNIA LOS ANGELES
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LOW, WALTER C 1 R03 AG05575
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MACRIDES, FOTEOS 1 R01 AG05678
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WORCESTER FOUNDATION FOR EXPER BIOLOGY
SHREWSBURY MASSACHUSETTS

MAN, EUGENE H 5 R01 AG04545
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UNIVERSITY OF MIAMI
CORAL GABLES FLORIDA

MANUELIDIS, ELIAS E 5 P01 AG03106
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YALE UNIVERSITY
NEW HAVEN CONNECTICUT

MARKESBERY, WILLIAM R 1 P01 AG05119
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UNIVERSITY OF KENTUCKY
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MARKESBERY, WILLIAM R 1 P50 AG05144
ALZHEIMER DISEASE RESEARCH CENTER
UNIVERSITY OF KENTUCKY
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UNIVERSITY OF KENTUCKY
LEXINGTON KENTUCKY

MAROTTA, CHARLES A 2 P01 AG02126
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MC LEAN HOSPITAL (BELMONT, MA)
BELMONT MASSACHUSETTS

MAROTTA, CHARLES A 1 R01 AG04522
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MC LEAN HOSPITAL (BELMONT, MA)
BELMONT MASSACHUSETTS

MARTIN, GEORGE M 1 P50 AG05136
ALZHEIMER DISEASE RESEARCH CENTER
UNIVERSITY OF WASHINGTON
SEATTLE WASHINGTON

MASTERS, JEFFREY N 5 F32 AG05335
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UNIVERSITY OF SOUTHERN CALIFORNIA
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MAYEUX, RICHARD P 2 R01 AG02802
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COLUMBIA UNIVERSITY NEW YORK
NEW YORK NEW YORK

MC NEILL, THOMAS H 1 K04 AG00300
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UNIVERSITY OF ROCHESTER
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MICHAELIS, MARY L 5 R01 AG04762
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UNIVERSITY OF KANSAS LAWRENCE
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MILLER, BRUCE L 1 K11 AG00284
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UNIVERSITY OF CALIFORNIA LOS ANGELES
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MIZUMORI, SHERI J Y 1 F32 AG05375
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UNIVERSITY OF COLORADO AT BOULDER
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MORIN, LAWRENCE P 1 R01 AG05773
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MORRELL, FRANK 5 R01 AG03410
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CHICAGO ILLINOIS

MOSS, MARK B 5 R01 AG04321
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BOSTON UNIVERSITY
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NAKAJIMA, YASUKO 9 R01 AG06093
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PURDUE UNIVERSITY WEST LAFAYETTE
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NIXON, RALPH A 1 R01 AG05604
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MC LEAN HOSPITAL (BELMONT, MA)
BELMONT MASSACHUSETTS

OSTERWEIL, DAN 1 K08 AG00259
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UNIVERSITY OF CALIFORNIA LOS ANGELES
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PARASURAMAN, RAJA 1 R03 AG05781
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CATHOLIC UNIVERSITY OF AMERICA
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PARK, JANIE C 1 R01 AG04889
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FLORIDA INSTITUTE OF TECHNOLOGY
MELBOURNE FLORIDA

PEDIGO, NORMAN W, JR 1 R01 AG04991
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LOUISIANA STATE UNIV MED CTR SHREVEPORT
SHREVEPORT LOUISIANA

PENDLEBURY, WILLIAM W 5 K08 AG00258
NEUROTRANSMITTER FUNCTION AND ALUMINUM NEUROTOXICITY
UNIVERSITY OF VERMONT & ST AGRIC COLLEGE
BURLINGTON VERMONT

PERL, DANIEL P 5 R01 AG01415
TRACE ELEMENTS IN AGED NEURONS AND SENILE DEMENTIA
UNIVERSITY OF VERMONT & ST AGRIC COLLEGE
BURLINGTON VERMONT

PERLMUTTER, LYNN S 1 F32 AG05373
CAPAIN LOCALIZATION RAT AGED AND ALZHEIMER'S BRAINS
UNIVERSITY OF CALIFORNIA IRVINE
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PETERS, ALAN 3 P01 AG00001
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BOSTON UNIVERSITY
BOSTON MASSACHUSETTS

PETTEGREW, JAY W 1 R01 AG05657
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UNIVERSITY OF PITTSBURGH
PITTSBURGH PENNSYLVANIA

PFEFFER, ROBERT I 5 R01 AG04785
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UNIVERSITY OF CALIFORNIA IRVINE
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PORTER, JOHN C 5 R01 AG04344
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UNIVERSITY OF TEXAS HLTH SCI CTR DALLAS
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PRICE, DONALD L 5 P50 AG05146
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BALTIMORE MARYLAND

PRICE, DONALD L 2 R01 AG03359
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JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

PRUSINER, STANLEY B 5 P01 AG02132
VIRAL DEGENERATIVE AND DEMENTING DISEASES IN AGING
UNIVERSITY OF CALIFORNIA SAN FRANCISCO
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PULLARKAT, RAJU K 1 R01 AG04244
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INSTITUTE FOR BASIC RES IN DEV DISABIL
NEW YORK NEW YORK

REIVICH, MARTIN 1 R01 AG05350
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ROGERS, JOSEPH 1 R03 AG05291
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ROPER, STEPHEN D 5 R01 AG03340
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DENVER COLORADO

ROSENHEIMER, JULIE L 1 F32 AG05340
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STANFORD CALIFORNIA

ROSES, ALLEN D 1 P50 AG05128
ALZHEIMER DISEASE RESEARCH CENTER
DUKE UNIVERSITY
DURHAM, N C

ROTUNDO, RICHARD LEE 1 R01 AG05917
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UNIVERSITY OF MIAMI
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SARKAR, DIPAK K 1 R01 AG05453
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SCHACHER, SAMUEL M 1 R01 AG04992
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NEW YORK STATE PSYCHIATRIC INSTITUTE
NEW YORK NEW YORK

SCHREIBMAN, MARTIN P 5 R01 AG01938
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BROOKLYN COLLEGE
NEW YORK NEW YORK

SELEMON, LYNN D 5 F32 AG05310
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YALE UNIVERSITY
NEW HAVEN CONNECTICUT

SELKOE, DENNIS J 1 R01 AG06173
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BOSTON MASSACHUSETTS

SHASHOUA, VICTOR E 1 R01 AG05675
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MC LEAN HOSPITAL (BELMONT, MA)
BELMONT MASSACHUSETTS

SIMPKINS, JAMES W 5 R01 AG02021
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UNIVERSITY OF FLORIDA
GAINESVILLE FLORIDA

SISKEN, JESSE E 1 R03 AG05277
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SLADEK, JOHN R, JR 5 R01 AG00847
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SMALL, GARY W 5 K08 AG00200
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SMITH, DEAN O 2 R01 AG01572
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STOPA, EDWARD G 1 K11 AG00295
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TERRY, ROBERT D 5 P01 AG05386
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UHLMANN, RICHARD F 1 K08 AG00265
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SEATTLE WASHINGTON

VITIELLO, MICHAEL V 5 R23 AG04348
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SEATTLE WASHINGTON

WAJDA, ISABEL J 1 R03 AG05011
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NATHAN S. KLINE INSTITUTE FOR PSYCH RES
ORANGEBURG NEW YORK

WALKER, RICHARD F 7 R01 AG06087
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MEDICAL COLLEGE OF PENNSYLVANIA
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WEILAND, NANCY G 1 F32 AG05357
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UNIVERSITY OF MARYLAND AT BALTIMORE
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WEINER, NORMAN 5 R01 AG03932
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UNIVERSITY OF COLORADO HLTH SCIENCES CTR
DENVER COLORADO

WILLOTT, JAMES F 5 K04 AG00234
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WISE, PHYLLIS M 5 K04 AG00168
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UNIVERSITY OF MARYLAND AT BALTIMORE
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WISE, PHYLLIS M 5 R01 AG02224
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UNIVERSITY OF MARYLAND AT BALTIMORE
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WISNIEWSKI, HENRYK M 5 P01 AG04220
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WORLEY, PAUL F 5 K11 AG00256
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YEN, SHU-HUI C 5 R01 AG01136
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NEW YORK NEW YORK

YEN, SHU-HUI C 5 R01 AG04145
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NEW YORK NEW YORK

ZWILLICH, CLIFFORD W 1 R01 AG04491
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HERSHEY PENNSYLVANIA

GERIATRICS BRANCH

SECTION: CARDIOVASCULAR/PULMONARY/RENAL RESEARCH

AKERA, TAI 5 R01 AG02398
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MICHIGAN STATE UNIVERSITY
EAST LANSING MICHIGAN

COX, ROBERT H 1 R01 AG04908
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GRADUATE HOSPITAL (PHILADELPHIA)
PHILADELPHIA PENNSYLVANIA

EGER, EDMOND I 5 P01 AG03104
PROGRAM PROJECT - AGING AND ANESTHESIA
UNIVERSITY OF CALIFORNIA SAN FRANCISCO
SAN FRANCISCO CALIFORNIA

HRUSHESKY, WILLIAM J 1 R43 AG06100
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KATZIR, DALIA 1 R01 AG05627
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STANFORD UNIVERSITY
STANFORD CALIFORNIA

KENNEDY, RICHARD H 1 K04 AG00276
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UNIVERSITY OF ARKANSAS MED SCIS LTL ROCK
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LIPSITZ, LEWIS A 5 K08 AG00213
ACADEMIC AWARD--NATIONAL INSTITUTE ON AGING
HARVARD UNIVERSITY
BOSTON MASSACHUSETTS

NEWMAN, JAMES J 1 R23 AG05290
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UNIVERSITY OF TEXAS HLTH SCI CTR DALLAS
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REUNING, RICHARD H 5 R01 AG04119
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OHIO STATE UNIVERSITY
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ROBERTS, JAY 5 R01 AG03326
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MEDICAL COLLEGE OF PENNSYLVANIA
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WHORTON, A RICHARD 2 R01 AG02868
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DUKE UNIVERSITY
DURHAM NORTH CAROLINA

SECTION: ENDOCRINOLOGY

BLIZZARD, ROBERT M 1 R01 AG04303
THE ROLE OF GROWTH HORMONE IN THE AGING PROCESS
UNIVERSITY OF VIRGINIA CHARLOTTESVILLE
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BRISKI, KAREN P 1 F32 AG05307
SECRETION OF REPRODUCTIVE HORMONES AND AGING
STATE UNIVERSITY OF NEW YORK AT BUFFALO
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CHATTERJEE, BANDANA 5 R01 AG03527
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OAKLAND UNIVERSITY
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CLEMMONS, DAVID R 5 R01 AG02331
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UNIVERSITY OF NORTH CAROLINA CHAPEL HILL
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DE PAOLO, LOUIS V 5 R01 AG03764
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DESJARDINS, CLAUDE 5 R01 AG00958
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FLORINI, JAMES R 3 R01 AG00629
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SYRACUSE UNIVERSITY AT SYRACUSE
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FORCIEA, MARY A 5 K08 AG00193
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DURHAM NORTH CAROLINA

SCHWARTZ, MYRNA F 5 R01 AG02231
PATTERNS OF COGNITIVE DEFICIT IN ALZHEIMER'S DISEASE
UNIVERSITY OF PENNSYLVANIA
PHILADELPHIA PENNSYLVANIA

SCOTT, BRIAN L 1 R43 AG06276
PHASE I-MULTIPLE CHANNELS WITH SINGLE-ELECTRODE IMPLANTS
SCOTT INSTRUMENTS CORPORATION
DENTON TEXAS

SEKULER, ROBERT W 5 R01 AG01251
HUMAN AGING AND VISUAL PERCEPTION
NORTHWESTERN UNIVERSITY
EVANSTON ILLINOIS

SIEGLER, ILENE C 5 T32 AG00029
BEHAVIOR AND PHYSIOLOGY IN AGING
DUKE UNIVERSITY
DURHAM NORTH CAROLINA

SIPLE, PATRICIA 5 R01 AG04081
AGING AND THE USE OF LINGUISTIC INTEGRATION
WAYNE STATE UNIVERSITY
DETROIT MICHIGAN

SLOANE, MICHAEL E 1 R03 AG05515
BINOCULAR VISION FOLLOWING MONOCULAR CATARACT REMOVAL
UNIVERSITY OF ALABAMA AT BIRMINGHAM
BIRMINGHAM ALABAMA

SMITH, JAMES C 1 R01 AG04932
THE AGE-RELATED EFFECT OF THE SWEET TASTE IN THE RAT
FLORIDA STATE UNIVERSITY
TALLAHASSEE FLORIDA

SMITH, STANLEY D 1 F32 AG05378
LANGUAGE DISORDERS IN ALZHEIMER'S DISEASE
UNIVERSITY OF CALIFORNIA SAN DIEGO
LA JOLLA CALIFORNIA

SMYER, MICHAEL A 5 T32 AG00048
GERONTOLOGY (INTERDISCIPLINARY)
PENNSYLVANIA STATE UNIVERSITY PARK
UNIVERSITY PARK PENNSYLVANIA

STEVENS, JOSEPH C 5 R01 AG04287
CHEMICAL SENSES AND AGING
JOHN B. PIERCE FOUNDATION LAB, INC.
NEW HAVEN CONNECTICUT

STORANDT MARTHA, 5 T32 AG00030
AGING AND DEVELOPMENT
WASHINGTON UNIVERSITY
SAINT LOUIS MISSOURI

STURR, JOSEPH F 5 R01 AG04465
MECHANISMS OF VISUAL SENSITIVITY
SYRACUSE UNIVERSITY AT SYRACUSE
SYRACUSE NEW YORK

UVELLI, DAVID A 1 R43 AG06280
ENHANCED MEDICAL ELECTRONICS USING SILICON COMPILERS
SEATTLE SILICON TECHNOLOGY, INC.
BELLEVUE WASHINGTON

WARREN, WILLIAM H, JR 1 R01 AG05223
AGE-RELATED CHANGES IN THE VISUAL CONTROL OF LOCOMOTION
BROWN UNIVERSITY
PROVIDENCE RHODE ISLAND

WERNER, JOHN S 5 R23 AG04058
OPTICAL AND NEURAL CHANGES IN THE AGING VISUAL SYSTEM
UNIVERSITY OF COLORADO AT BOULDER
BOULDER COLORADO

WILLIS, SHERRY L 1 R01 AG05304
LONG-TERM EFFECTS OF COGNITIVE TRAINING IN THE ELDERLY
PENNSYLVANIA STATE UNIVERSITY PARK
UNIVERSITY PARK PENNSYLVANIA

WINGFIELD, ARTHUR 5 R01 AG04517
AGE AND DECISION STRATEGIES IN RUNNING MEMORY FOR SPEECH
BRANDEIS UNIVERSITY
WALTHAM MASSACHUSETTS

WOOD, LARRY E 1 R03 AG04669
USE OF IMAGERY AS AN AID TO MEMORY IN THE ELDERLY
BRIGHAM YOUNG UNIVERSITY
PROVO UTAH

ZACKS, ROSE T 1 R01 AG04306
AGING, WORKING MEMORY CAPACITY, AND DISCOURSE PROCESSING
MICHIGAN STATE UNIVERSITY
EAST LANSING MICHIGAN

ZELINSKI, ELIZABETH M 5 R01 AG04114
ADULT AGE DIFFERENCES IN ONLINE READING COMPREHENSION
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES CALIFORNIA

SOCIAL PSYCHOLOGICAL AGING

AISNER, JOSEPH 5 R01 AG05253
PSYCHOSOCIAL SUPPORT & INTENSIVE CANCER TREATMENT
UNIVERSITY OF MARYLAND AT BALTIMORE
BALTIMORE MARYLAND

ALWIN, DUANE F 5 R01 AG04743
POLITICAL ORIENTATIONS OVER THE LIFE-SPAN
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

ANTONUCCI, TONI C 1 K04 AG00271
SOCIAL SUPPORT OVER THE LIFE COURSE
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

BECKER, GAYLENE 5 R01 AG04053
SOCIO-CULTURAL MECHANISMS OF REHABILITATION IN OLD AGE
UNIVERSITY OF CALIFORNIA SAN FRANCISCO
SAN FRANCISCO CALIFORNIA

BENGTSON, VERN L 5 R01 AG04092
A LONGITUDINAL STUDY OF AGING PARENTS
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES CALIFORNIA

BERKANOVIC, EMIL 1 R01 AG05181
PSYCHOSOCIAL FACTORS IN THE AGED'S USE OF HMO SERVICES
MAXICARE RESEARCH AND EDUCATION FDN
LOS ANGELES CALIFORNIA

BIRREN, JAMES E 5 T32 AG00101
TRAINING IN HEALTH, BEHAVIOR, AND AGING
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES CALIFORNIA

BOOTH, ALAN 5 R01 AG04146
MARITAL INSTABILITY OVER THE LIFE COURSE
UNIVERSITY OF NEBRASKA LINCOLN
LINCOLN NEBRASKA

BOSSE', RAYMOND 2 R01 AG02287
THE EFFECT OF RETIREMENT ON PHYSICAL HEALTH
HELLENIC COLLEGE
BROOKLINE MASSACHUSETTS

BOTWINICK, JACK 1 R03 AG05031
AGING AND TYPE A/B BEHAVIOR
WASHINGTON UNIVERSITY
SAINT LOUIS MISSOURI

BUTLER, EDGAR W 5 R01 AG03857
DEATH AND BEREAVEMENT: A LONGITUDINAL STUDY OF THE AGED
UNIVERSITY OF CALIFORNIA RIVERSIDE
RIVERSIDE CALIFORNIA

CLAUSEN, JOHN A 5 R01 AG04178
OCCUPATION AND FAMILY IN LATER MATURITY
UNIVERSITY OF CALIFORNIA BERKELEY
BERKELEY CALIFORNIA

CLUBB, JEROME M 5 P30 AG04590
FACTORS IN AGING: DEVELOPING RESEARCH RESOURCES
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

COHEN, HARVEY J 5 P30 AG00371
RESEARCH SUPPORT SERVICES FOR GERONTOLOGY CENTER
DUKE UNIVERSITY
DURHAM NORTH CAROLINA

COHLER, BERTRAM J 5 T32 AG00039
ADULT DEVELOPMENT AND AGING
UNIVERSITY OF CHICAGO
CHICAGO ILLINOIS

COLEMAN, LERITA M 5 R23 AG04285
WORK, MIDDLE-AGED, AND OLDER WOMEN
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

DIMOND, MARGARET F 1 R01 AG06244
GROUP WORK WITH BEREAVED ELDERS: AN INTERVENTION STUDY
UNIVERSITY OF UTAH
SALT LAKE CITY UTAH

DUNKLE, RUTH E 1 R01 AG05635
EFFECT OF STRESS ON FUNCTIONING OF THE OLDEST-OLD
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

EKERDT, DAVID J 1 R01 AG05661
RETIREMENT AND MARITAL QUALITY
BOSTON UNIVERSITY
BOSTON MASSACHUSETTS

ESSEX, MARILYN J 1 R03 AG05788
PSYCHOSOCIAL FACTORS AND HEALTH AMONG THE OLDEST OLD
UNIVERSITY OF WISCONSIN MADISON
MADISON WISCONSIN

FEATHERMAN, DAVID L 1 P01 AG04877
INDIVIDUAL AGING
UNIVERSITY OF WISCONSIN MADISON
MADISON WISCONSIN

FOLEY, JOSEPH M 1 R03 AG05041
COMATOSE/VEGETATIVE PATIENT--ISSUES IN CARE
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

FORD, AMASA B 5 P01 AG04391
TEACHING NURSING HOME AWARD
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

FRETZ, BRUCE R 1 R03 AG05279
PRERETIREES MENTAL AND PHYSICAL HEALTH VULNERABILITIES
UNIVERSITY OF MARYLAND COLLEGE PK CAMPUS
COLLEGE PARK MARYLAND

GERMAN, PEARL S 5 R01 AG04343
DRUG SIDE EFFECTS AND FUNCTIONAL CAPACITY IN THE ELDERLY
JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

GIBSON, ROSE C 5 R23 AG03553
PHYSICAL DISABILITY AND COPING AMONG OLDER BLACK WOMEN
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

GIELE, JANET Z 5 R01 AG04759
LIFE COURSE PATTERNS AND WELL-BEING IN EDUCATED WOMEN
BRANDEIS UNIVERSITY
WALTHAM MASSACHUSETTS

HARDY, MELISSA A 5 R01 AG04258
THE IMPACT OF JOB CHARACTERISTICS ON RETIREMENT BEHAVIOR
FLORIDA STATE UNIVERSITY
TALLAHASSEE FLORIDA

HAUG, MARIE R 5 R01 AG03476
HEALTH AND WOMEN'S RETIREMENT DECISIONS AND ADAPTATIONS
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

HAYWARD, MARK D 1 R01 AG04915
DIMENSIONS OF THE WORK ROLE AND THE RETIREMENT DECISION
BATTELLE MEMORIAL INSTITUTE
COLUMBUS OHIO

HERZOG, ANNA R 5 R01 AG02038
INTERVIEWING OLDER ADULTS: NON-SAMPLING SURVEY ERRORS
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

HIBBARD, JUDITH H 5 R23 AG03824
FEMALE LIFE PATTERNS--AGING AND HEALTH
KAISER FOUNDATION RESEARCH INSTITUTE
OAKLAND CALIFORNIA

HOUSE, JAMES S 1 P01 AG05561
PRODUCTIVITY STRESS AND HEALTH IN MIDDLE AND LATE LIFE
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

HUFFINE, CAROL L 1 R01 AG05184
PSYCHOSOCIAL INFLUENCES ON HEALTH THROUGH MIDDLE AGE
UNIVERSITY OF CALIFORNIA BERKELEY
BERKELEY CALIFORNIA

IDE, BETTY A 5 R01 AG03810
COPING AND HEALTH AMONG OLDER URBAN WIDOWS
UNIVERSITY OF ARIZONA
TUCSON ARIZONA

KAHANA, EVA F 3 R01 AG05354
STRESS, RESOURCES AND THE HEALTH OF THE AGED
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

KAHN, ALAN R 1 R43 AG05481
AUTOMATIC DRUG DISPENSER FOR PATIENT CARE AT HOME
CINCINNATI CONTROL DYNAMICS, INC.
CINCINNATI OHIO

KAPLAN, GEORGE A 5 R01 AG04610
EPIDEMIOLOGY OF AGING IN ALAMEDA COUNTY: 1965-1982
CALIFORNIA PUBLIC HEALTH FOUNDATION
BERKELEY CALIFORNIA

KELMAN, HOWARD R 5 P01 AG03424
BEHAVIORAL FACTORS ON HEALTH AND ILLNESS IN AGED PERSONS
MONTEFIORE MEDICAL CENTER (BRONX, NY)
NEW YORK NEW YORK

KITSON, GAY C 5 R01 AG04561
WIDOWS AND DIVORCEES--LIFE COURSE PATTERNS IN ADJUSTMENT
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

KITTNER, STEVEN J 1 R03 AG05786
DEMENTIA DEPRESSION AND DISABILITY IN A NURSING HOME
JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

KIYAK, H ASUMAN 5 R01 AG04070
ADAPTATION AMONG ELDERLY WITH ALZHEIMER'S DISEASE
UNIVERSITY OF WASHINGTON
SEATTLE WASHINGTON

LEVENTHAL, HOWARD 5 R01 AG03501
ILLNESS COGNITION AND COPING IN THE ELDERLY
UNIVERSITY OF WISCONSIN MADISON
MADISON WISCONSIN

LIANG, JERSEY 5 R01 AG06077
A PANEL ANALYSIS OF WELL-BEING AMONG THE AGED
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

LIANG, JERSEY 7 R01 AG06076
MEASUREMENT MODELS OF WELL-BEING AMONG THE AGED
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

LONG, ANDREA L 5 R01 AG05289
AGING & ADJUSTMENT TO UNEMPLOYMENT: A LONGITUDINAL STUDY
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

MADDOX, GEORGE 1 R01 AG05322
DATA RESOURCES FOR SECONDARY ANALYSIS
DUKE UNIVERSITY
DURHAM NORTH CAROLINA

MATTHEWS, SARAH H 1 R01 AG04896
STRENGTH OF TIES WITH HIGH SCHOOL CLASSMATES IN OLD AGE
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

MC KINLAY, SONJA M 1 P01 AG04673
HEALTH AND EFFECTIVE FUNCTIONING IN THE NORMALLY AGING
AMERICAN INSTITUTES FOR RESEARCH
CAMBRIDGE MASSACHUSETTS

MC KINLAY, SONJA M 5 R01 AG03111
AN EPIDEMIOLOGICAL INVESTIGATION OF THE MENOPAUSE
AMERICAN INSTITUTES FOR RESEARCH
CAMBRIDGE MASSACHUSETTS

MECHANIC, DAVID 1 R01 AG05400
ILLNESS BEHAVIOR AND MEDICAL USE BY ELDERLY IN AN HMO
RUTGERS THE STATE UNIV NEW BRUNSWICK
NEW BRUNSWICK NEW JERSEY

MEREDITH, WILLIAM M 5 R01 AG03164
INTELLECTUAL DEVELOPMENT: GROUP AND INDIVIDUAL PATTERNS
UNIVERSITY OF CALIFORNIA BERKELEY
BERKELEY CALIFORNIA

MIDLARSKY, ELIZABETH 5 R01 AG03068
ALTRUISM AND HELPING AMONG THE ELDERLY
UNIVERSITY OF DETROIT
DETROIT MICHIGAN

MITTENESS, LINDA S 1 K04 AG00274
NATURAL HISTORY & FOLK ETIOLOGY OF AGE-RELATED DISORDERS
UNIVERSITY OF CALIFORNIA SAN FRANCISCO
SAN FRANCISCO CALIFORNIA

MOSSEY, JANA M 5 R01 AG03762
PHYSICIAN USE, ILLNESS, AND MORTALITY AMONG THE ELDERLY
TEMPLE UNIVERSITY
PHILADELPHIA PENNSYLVANIA

MOSSEY, JANA M 5 R01 AG04095
DETERMINANTS OF RECOVERY AMONG OLDER WOMEN
TEMPLE UNIVERSITY
PHILADELPHIA PENNSYLVANIA

MUDRICK, NANCY R 5 R01 AG04347
DISABILITY AND SOCIAL ROLES IN MIDLIFE WOMEN
SYRACUSE UNIVERSITY AT SYRACUSE
SYRACUSE NEW YORK

MURRELL, STANLEY A 5 R01 AG04551
OLDER ADULT BEREAVEMENT, PRE-EVENT RESOURCES, AND HEALTH
UNIVERSITY OF LOUISVILLE
LOUISVILLE KENTUCKY

NESSELROADE, JOHN R 1 T32 AG00110
TRAINING IN AGING RESEARCH METHODOLOGY
PENNSYLVANIA STATE UNIVERSITY PARK
UNIVERSITY PARK PENNSYLVANIA

NEUGARTEN, BERNICE L 5 R13 AG04508
PLANNING AND TRAVEL--1985 INT'L CONGRESS OF GERONTOLOGY
GERONTOLOGICAL SOCIETY OF AMERICA
WASHINGTON DIST OF COL

NEWMAN, SANDRA J 5 R01 AG04375
LIFE ADJUSTMENTS TO AGING: AN EVALUATION OF NEW DATA
JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

O'BRIEN, RUTH A 5 R01 AG04028
SOCIAL SUPPORT PROCESSES IN WELL-BEING OF BEREAVED
UNIVERSITY OF ROCHESTER
ROCHESTER NEW YORK

OGILVIE, DANIEL M 1 R03 AG05035
IDENTITY STRUCTURE AND RETIREMENT
RUTGERS THE STATE UNIV NEW BRUNSWICK
NEW BRUNSWICK NEW JERSEY

PALLADINO, LUCY J 1 R43 AG05740
VIDEO PROGRAMMING STRESS MANAGEMENT FOR CAREGIVERS
GOOD HEALTH COMMUNICATIONS
TUCSON ARIZONA

PEARSON, THOMAS A 5 R01 AG01760
PRECURSORS OF PREMATURE DISEASE AND DEATH
JOHNS HOPKINS UNIVERSITY
BALTIMORE MARYLAND

QUAYHAGEN, MARY P 1 R03 AG06085
ALZHEIMER'S: EFFICACY OF HOME STIMULATION AND SUPPORT
UNIVERSITY OF SAN DIEGO
SAN DIEGO CALIFORNIA

RAKOWSKI, WILLIAM 1 K01 AG00266
CARDIOVASCULAR RISK FACTORS AND BEHAVIORAL GERIATRICS
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

RODIN, JUDITH 5 R01 AG02455
DIETARY HABITS, SOCIAL FACTORS, STRESS & HEALTH
YALE UNIVERSITY
NEW HAVEN CONNECTICUT

ROGERS, THERESA F 5 R01 AG03827
SOCIAL AGING AND THE WORK STATUS OF DIALYSIS PATIENTS
COLUMBIA UNIVERSITY NEW YORK
NEW YORK NEW YORK

RUSSELL, DANIEL W 5 R01 AG03846
PSYCHOSOCIAL FACTORS--HEALTH AND WELL-BEING AND AGING
UNIVERSITY OF IOWA
IOWA CITY IOWA

SATARIANO, WILLIAM A 5 R01 AG04969
HEALTH AND FUNCTIONING IN OLDER WOMEN WITH BREAST CANCER
MICHIGAN CANCER FOUNDATION
DETROIT MICHIGAN

SCHAIE, K WARNER 5 R01 AG04041
PRECURSORS OF PSYCHOLOGICAL WELL-BEING IN OLD AGE
PENNSYLVANIA STATE UNIVERSITY PARK
UNIVERSITY PARK PENNSYLVANIA

SCHULZ, RICHARD 7 R01 AG06243
CHANGES CAUSED BY A DISABLING STROKE
UNIVERSITY OF PITTSBURGH
PITTSBURGH PENNSYLVANIA

SPIELMAN, ARTHUR J 1 R01 AG05732
SLEEP RESTRICTION THERAPY IN ELDERLY CHRONIC INSOMNIACS
CITY COLLEGE OF NEW YORK
NEW YORK NEW YORK

SVARSTAD, BONNIE L 1 R01 AG05120
PREDICTING THE USE OF SLEEP MEDICATIONS IN NURSING HOMES
UNIVERSITY OF WISCONSIN MADISON
MADISON WISCONSIN

THOMPSON, LARRY W 5 R01 AG01959
MULTIPLE FACTORS IN COPING WITH GRIEF IN THE ELDERLY
UNIVERSITY OF SOUTHERN CALIFORNIA
LOS ANGELES CALIFORNIA

THREATT, BARBARA A 5 R01 AG05252
CARE AND ADJUSTMENT OF ELDERLY BREAST CANCER PATIENTS
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

TOBIS, JEROME S 1 P01 AG03975
INTERVENTION EFFECTS--PSYCHOBIOLOGICAL DECLINE IN AGING
UNIVERSITY OF CALIFORNIA IRVINE
IRVINE CALIFORNIA

TROPMAN, JOHN E 1 T32 AG00117
SOCIAL RESEARCH TRAINING ON APPLIED ISSUES OF AGING
UNIVERSITY OF MICHIGAN AT ANN ARBOR
ANN ARBOR MICHIGAN

WILLIAMS, BEN T 1 R43 AG06021
MORBIDITY RISK ASSESSMENT IN THE ELDERLY
UNIVERSITY PARK PATHOLOGY ASSOC, P.C.
URBANA ILLINOIS

WINGARD, DEBORAH L 1 R01 AG05687
SEX DIFFERENCES IN HEALTH IN ALAMEDA COUNTY: 1965-1983
CALIFORNIA PUBLIC HEALTH FOUNDATION
BERKELEY CALIFORNIA

WOLINSKY, FREDRIC D 7 K04 AG00328
HEALTH AND ILLNESS BEHAVIOR AMONG THE AGED
TEXAS AGRI AND MECH UNIV COLLEGE STATION
COLLEGE STATION TEXAS

WOODBURY, MAX A 2 R01 AG03188
LONGITUDINAL MODELS OF CORRELATES OF AGING AND LONGEVITY
DUKE UNIVERSITY
DURHAM NORTH CAROLINA

WYKLE, MAY L 5 R01 AG04733
FACTORS IN SELF CARE BEHAVIORS OF AGED COHORTS
CASE WESTERN RESERVE UNIVERSITY
CLEVELAND OHIO

ZAUTRA, ALEX J 5 R01 AG04924
LIFE EVENTS AND DEMORALIZATION IN THE ELDERLY
ARIZONA STATE UNIVERSITY
TEMPE ARIZONA

Table 4

Active Contracts and Intra/Interagency Agreements
National Institute on Aging
(Fiscal Year 1985)

Biomedical Research and Clinical Medicine Program

Characterize and Distribute Genetically Marked Cells Institute for Medical Research Camden, New Jersey	N01-AG02100
Nine-Year Multigenotypic Aged Mouse Colony Charles River Breeding Laboratories Wilmington, Delaware	N01-AG32103
Development and Maintenance of a Colony of Genetically Defined Aged Mice Harlan-Sprague-Dawley, Inc. Indianapolis, Indiana	N01-AG32104
Pathology Monitoring, F344 Rat Colony Biopath, Inc. Rockville, Maryland	N01-AG32122
Primate Resource and Biomarkers Development University of Washington Seattle, Washington	N01-AG42101
Monitoring of a Multigenotypic Aged Mouse Colony Microbiological Associates Bethesda, Maryland	N01-AG42103
Caenorhabditis Genetics Center University of Missouri Columbia, Missouri	N01-AG42111
Maintenance of a Long-Term Colony of Aged Hybrid Rats Charles River Breeding Laboratories Wilmington, Massachusetts	N01-AG52115
Clinical Trials: Systolic Hypertension in the Elderly Population (SHEP) Funds transferred from NIA to the National Heart, Lung, and Blood Institute for multicontract awards.	N01-HL5-
Establishment and Maintenance of a Frozen Embryo Bank Department of Energy--Oak Ridge National Laboratory Oak Ridge, Tennessee	Y01-AG50068

Behavioral Sciences Research Program

Support of University of Michigan Panel Study of Income Dynamics (PSID) National Science Foundation Washington, D.C.	Y01-AG10034
Age Changes in Vision and Hearing Office of Naval Research Arlington, Virginia	Y01-AG10035
Census Monograph Series: Monograph on Aging in America National Science Foundation Washington, D.C.	Y01-AG30044
Statistical Problems in Policy Analysis for an Aging Population National Center for Health Statistics Hyattsville, Maryland	Y01-AG40050
Committee for Basic Research National Academy of Science Washington, D.C.	Y01-AG40053
Prevention of Falls in the Elderly Health Care Financing Administration Washington, D.C.	Y02-AG50054
Development of an International Data Base on Aging Bureau of the Census Suitland, Maryland	Y01-AG50055
Develop History Data File on the Elderly Population National Center for Health Statistics Hyattsville, Maryland	Y01-AG50059
Special Tabulations and Evauation of the 1980 Census Data Bureau of the Census Suitland, Maryland	Y01-AG50060
Tracking Mortality Experience of Respondents to the 1984 Aging Supplement to the National Health Interview Survey National Center for Health Statistics Hyattsville, Maryland	Y01-AG50070
Multicenter Sociobehavioral Intervention Research National Institute of Mental Health Rockville, Maryland	Y02 AG50071
The Longitudinal Study of Aging National Center for Health Statistics Hyattsville, Maryland	Y01-AG50072

Epidemiology, Demography, and Biometry Program

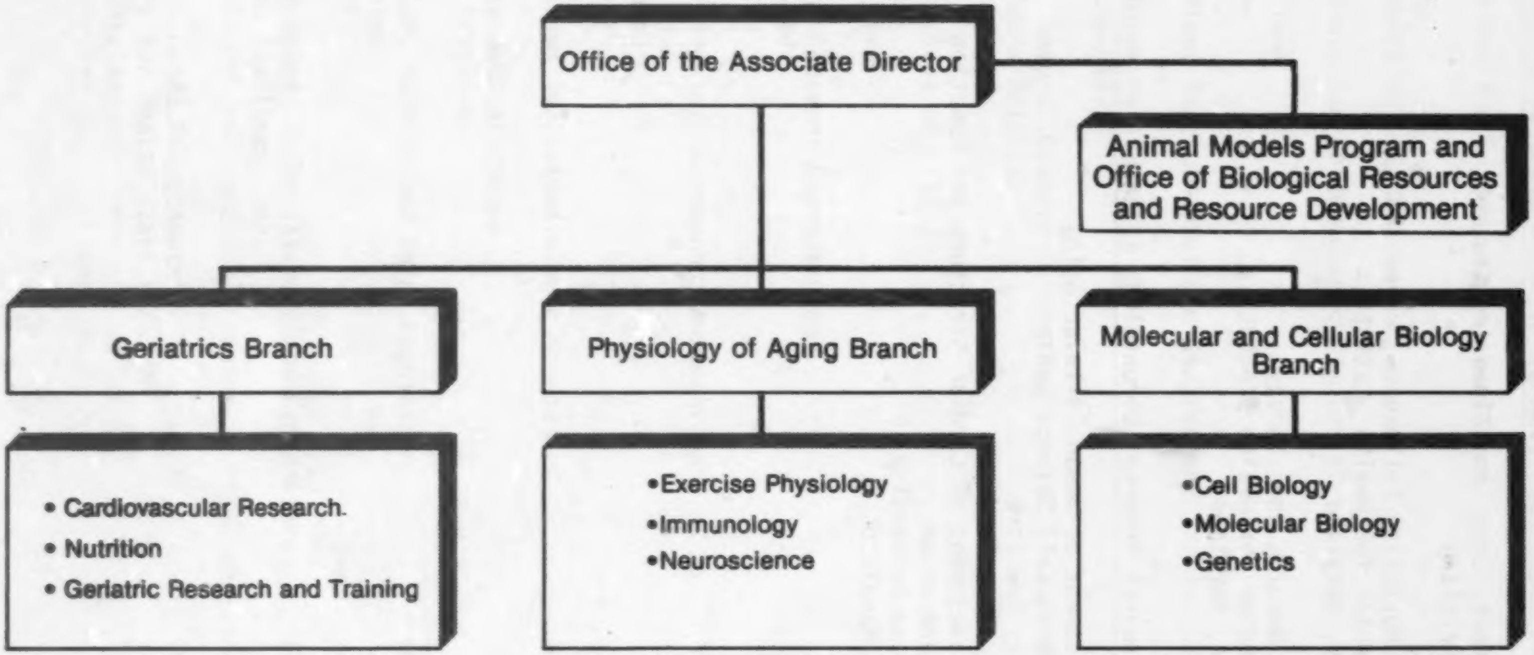
Establish Populations for Epidemiologic Studies of the Elderly Yale University New Haven, Connecticut	N01-AG02105
Establish Populations for Epidemiologic Studies of the Elderly University of Iowa Iowa City, Iowa	N01-AG02106
Establish Populations for Epidemiologic Studies of the Elderly Peter Bent Brigham Hospital Boston, Massachusetts	N01-AG02107
Senile Dementia: Natural History Peter Bent Brigham Hospital Boston, Massachusetts	N01-AG12106
Survey of the Last Days of Life DMH Associates New York, New York	N01-AG22137
Aging, Health, and Consumer Expenditures ICF, Incorporated Washington, D.C.	N01-AG32117
Updating and Revising the Macroeconomic-Demographic Model ICF, Incorporated Washington, D.C.	N01-AG42107
Establish Populations for Epidemiologic Studies of the Elderly Duke University Medical Center Durham, North Carolina	N01-AG42110
Household Formation, Housing and Aging Population ICF, Incorporated Washington, D.C.	N01-AG52106
Microeconomics of Aging, Health Status, and Expenditures Applied Systems Institute, Inc. Washington, D.C.	N01-AG52107
Follow-Up Study of Hanes Respondents National Center for Health Statistics Hyattsville, Maryland	Y01-AG90018

Senile Dementia Among Participants in the Framingham Heart Study National Heart, Lung, and Blood Institute Bethesda, Maryland	Y02-AG20040
1986 National Mortality Followback Survey (NMFS) National Center for Health Statistics Hyattsville, Maryland	Y01-AG50057
1985 National Nursing Home Survey National Center for Health Statistics Hyattsville, Maryland	Y01-AG50062

Intramural Research Program (Gerontology Research Center, Baltimore)

In Vitro Assessment of Human Cellular Aging W. Alton Jones Cell Science Center Lake Placid, New York	N01-AG22132
Noninvasive Assessment of Cardiac Structure and Function in Aging Men and Women Johns Hopkins University Baltimore, Maryland	N01-AG42109

Biomedical Research and Clinical Medicine Program


Office of the Associate Director
Animal Models Program and Office of Biological Resources and Resource Development
Geriatrics Branch
Physiology of Aging Branch
Molecular and Cellular Biology Branch
• Cardiovascular Research.
• Nutrition
• Geriatric Research and Training
•Exercise Physiology
•Immunology
•Neuroscience
•Cell Biology
•Molecular Biology
•Genetics

10/1/85

BIOMEDICAL RESEARCH AND CLINICAL MEDICINE (BRCM) PROGRAM

The Biomedical Research and Clinical Medicine (BRCM) Program is responsible for the planning, organization, and direction of programs of extramural and collaborative research related to biological and clinical aspects of aging; the conceptualization of new research directions and projects in the aging field; and the management and evaluation of grant applications.

Selected Program Activities in FY 1985

The following highlights of BRCM activities are brief excerpts from more detailed descriptions contained in the program sections. The program sections also contain descriptions of many ongoing activities and initiatives not referred to here.

- The clinical trial for treatment of Systolic Hypertension in the Elderly Population (SHEP), cofunded by NIA and the National Heart, Lung, and Blood Institute (NHLBI), has begun. Seventeen clinical centers and one coordinating center have been funded. Staff of BRCM's Geriatrics Branch has participated in all of the developmental activities needed to initiate and maintain this challenging study.

- The proceedings of a symposium organized by BRCM in May 1984 on problems of conducting clinical research with older persons will soon be published in the *Annals of Internal Medicine*.

- Clinical trials of behavioral therapies for urinary incontinence, cofunded by NIA and the Division of Nursing of the Health Resources and Services Administration (HRSA), have also begun. An important feature of these trials is the coordination of data collection among the trial sites.

- A major achievement in the Animal Models Program is the development of a colony of aging Rhesus monkeys for use by NIA grantees. This colony of 120 monkeys (20 male and 100 female), currently aged 16 to 18 years, was acquired specifically to provide a source of aged nonhuman primates that can be used in acute experiments. Creation of this colony should solve a long-perceived problem for investigators in a variety of research areas ranging from behavior to neurobiology.

- The National Institute of General Medical Sciences (NIGMS) and the NIH Division of Research Resources (DRR) have begun cofunding the NIA-sponsored Caenorhabditis Genetic Stock Center. Cofunding of this activity by other NIH organizations whose grantees make use of the center has been a priority issue for the Genetics Program for several years.

- Staff of BRCM's Molecular and Cellular Biology Branch and the Deputy Director, NIA, organized a highly successful workshop on the Molecular Biology of Aging in September 1984. A major outcome of this workshop was the development of a program announcement on the "Molecular, Biological and Genetic Basis of Aging" released in March 1985. This activity, together with Congressional support in the form of set-aside funds, has provided a major boost to program efforts to attract "cutting edge" scientists to aging research.

- o Five additional Alzheimer Disease Research Center (ADRC) awards were made in September 1985, bringing the total number of ADRC's supported by the Institute to ten.
- o Programming activities in research on exercise by staff of BRCM's Physiology of Aging Branch have begun to produce tangible results as evidenced by funded grants in areas that are highly relevant and meritorious.

Overview of Plans for FY 1986

- o As a result of a 1984 workshop cosponsored by NIA and NHLBI on "Blood Pressure Regulation and Aging" and the important research areas identified by the participants, a jointly sponsored NIA-NHLBI request for applications (RFA) has been proposed for this area of research.
- o The outcome of an FY 1985 workshop on osteoarthritis, jointly sponsored by NIA and the National Institute of Arthritis, Diabetes, and Digestive and Kidney Disease (NIADDK), will likely result in a jointly issued RFA.
- o As a result of an FY 1985 RFA for neurologic and cardiovascular research projects on falls by older people, it is expected that review and funding of successful applications along with a meeting of the principal investigators will occur in FY 1986.
- o A Special Emphasis Research Career Award (SERCA) for research on nutrition and aging has been proposed.
- o During FY 1986 the Animal Models contract program will expand through the hybrid rat contract and the biomarkers contract to provide alternatives to the Fisher 344 models. The addition of the new primate colony will provide a large mammal alternative model for development of NIA programs.
- o The continued development of a strong mammalian genetics research effort will receive major program emphasis through concentrated recruitment of "modern" molecular geneticists to aging research, as well as continued development of genetic biomarkers of aging.
- o Program emphasis in the molecular biology program will be placed on the development of an active program involving recruitment and training of the pool of scientists needed to exploit the new research opportunities in this area.
- o During FY 1986, BRCM's Neuroscience of Aging program will focus on two important conference activities: one on "Heavy Metals of Trace Elements and Aging," to be jointly sponsored with the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS), the National

Institute of Mental Health (NIMH), the American Association of Retired Persons (AARP), and the National Academy of Science (NAS); and another on the "Role of Calcium in Biological Mechanisms of Aging." In addition, based on discussions at the NIA-EURAGE-WHO planning meeting held this past July in conjunction with the XIII Congress of the International Association of Gerontology, activities will be undertaken to encourage cross-national studies on the development of international standards and research criteria for the diagnosis of Alzheimer disease.

- Also to be pursued are RFAs to stimulate research on diagnosis of Alzheimer disease and on the role of trace elements on aging processes.
- The neuroscience program will use recommendations from an ongoing evaluation study of the Institute's Alzheimer disease research program to plan new program initiatives.
- The exercise physiology program is in a developmental phase. The objective of activities in upcoming years will be to continue to provide a focus for this program. Particular emphasis will be placed on the study of exercise as an intervention for maintaining health in healthy (i.e., nondiseased) older people. The fundamental question is to what extent, and in relation to what other variables (i.e., disease and life style) is exercise a medically reasonable recommendation for older people.

Physiology of Aging Branch (PAB)

The mission of this branch is to stimulate the development of scientific knowledge and to facilitate the translation of basic medical and scientific information into practical applications for the treatment and care of elderly patients. The PAB has responsibility for three programs: Neuroscience, Immunology, and Exercise Physiology. Since these programs have a complementary scientific relationship, they are integrated into a single branch. Through its component programs, PAB fosters research on age-related physiological processes at the tissue, organ, organ system, and organism levels. Questions concerning age-related changes in the structure and function of various types of membranes is one of the emerging scientific issues that ties together the three programs of this branch. Questions concerning age-related changes in receptor function and transport mechanisms across membranes are some of the most important cross-cutting issues facing the programs of PAB.

Neuroscience of Aging Program (NAP)

The overall objective of the Neuroscience of Aging Program is to foster research on the relationship between aging and changes in the structure and function of the nervous system. The program fosters a broad spectrum of studies on the neuroscience of aging using the traditional approaches of neurology, neurobiology, neuroanatomy, neurochemistry, neuropharmacoloy, neuroendocrinology, neuroimmunology, neurophysiology, neuropsychology, pathology, histochemistry, histology, electrophysiology, and biophysics to study age-related changes in the nervous system.

Areas of special interest are:

- Age-related changes or decrements in the structure and function of the nervous system
- Basic, clinical, and epidemiologic studies of the etiology, diagnosis, and treatment of Alzheimer disease (AD) and other dementias in older people
- Neural mechanisms of learning and memory disorders in older people, including neurochemical and structural changes
- Age-related changes or impairments in sensory functions, (e.g., auditory, visual, olfactory, and gustatory) as well as decrements in motor functions or fine motor coordination (e.g., hand-eye coordination)
- The neurological basis of sleep disorders, insomnia, and sleep apnea in older people

Developmental Activities and Achievements, FY 1985

In August 1984, a second RFA was issued for the NIA Alzheimer Disease Research Center (ADRC) Program. In response to this announcement, there were 52 telephone inquiries and 26 inquiries by mail, 11 Letters of Intent, and 12 completed applications. In September 1985 five additional ADRCs were funded.

The first meeting of the Directors of the Alzheimer Disease Research Centers funded in FY 1984 was held in February 1985. Plans for developing a common clinical data-gathering protocol were discussed. Work has begun to develop a coordinated data-gathering procedure.

In December 1983, a research planning workshop on the diagnosis of Alzheimer disease was held. The meeting was jointly sponsored by NIA, AARP, NINCDS, and NIMH. Approximately 38 clinicians and investigators, representing neurology, neuropathology, neurochemistry, neuropsychology, neuroradiology, and psychiatry, participated in the three-day conference. The proceedings of this workshop have been accepted for publication in the Archives of Neurology and will be published soon.

In November 1984, at the annual meeting of the Society for Neuroscience, the NIA Information Office, in collaboration with program staff, presented the Institute's program goals to potential grantees. The NIA display booths at these meetings provided the staff with excellent opportunities for program development.

This past July, the NIA collaborated with EURAGE and the World Health Organization, in conjunction with the XIII Congress of the International Association of Gerontology (IAG), to sponsor a planning meeting for the development of international standards and research criteria for the diagnosis of Alzheimer disease. These discussions, which were presented to the participants at the IAG, led to the recommendation that a diagnostic instrument be developed for testing by the partaicipants and established the basis for many other multinational studies.

The Evaluation Panel of the NIA Alzheimer Disease Program held its first meeting in April 1985. This panel will produce a document identifying the strengths and weaknesses of the NIA extramural AD program to guide future development in this area.

Research Highlights, FY 1985

- Dr. Henryk Wisniewski reports the development of a method for cutting supra-ultration thin sections of neurofilaments. Electron-microscopic examination of these extremely thin sections of neurofilaments has revealed that these cytoskeletal elements are composed of four protofilaments, each of which is formed of globular units connected by longitudinal bars. A cross-sectional view of neurofilaments reveals the presence of four globular units, 20-25A in diameter, connected by four transverse bars, 25-30A in length. The 10 nm filaments that form paired helical filaments (PHF) in the brains of patients with Alzheimer disease are also made up of similar beaded strands. However, comparison between PHF and neurofilament protofilaments has revealed structural differences. The globular units making up the PHF protofilaments appear to be larger and the longitudinal bars longer than those in normal neurofilaments. This study is important because it provides physical evidence for the long-suspected structural relationship of PHF with normal neurofilament in the neurons. (H. M. Wisniewski, P01 AG04220)

- Dr. Dennis Selkoe reports that he has been able to purify the extracellular amyloid cores of senile plaques using amyloid plaque antibodies and fluorescence-activated cell sorting. He has identified a 7-9000 M.W. soluble peptide from the amyloid core. This peptide is not seen in similarly prepared fractions of normal aged human cortex free of amyloid cores. These findings are important because they may lead to more detailed study of putative protein precursors of these fibers. The availability of soluble portions of the amyloid fibers will enable extensive protein chemistry and molecular genetic studies to be carried out on the amyloid fibers. In addition, Dr. Selkoe reports that amino acid analyses of the purified amyloid suggest a considerable degree of similarity to the composition of partially purified paired helical filaments. Certain antigenic determinants also appear to be shared between the intraneuronal fibers (PHF) and the extracellular fibers (plaque amyloid). Thus, the study of the soluble protein from the amyloid fibers may lead to insights into the molecular composition of the PHF which is difficult to purify to homogeneity. (D. J. Selkoe, R01 AG05551)

- Neurofibrillary tangles (NFT) are the principal structural changes observed in nerve cells obtained from Alzheimer diseased brains and some normal aged brains. The biochemical composition of the fibers comprising these intraneuronal lesions is unknown. Dr. Selkoe and his co-workers report the production of three monoclonal antibodies against the microtubule-associated protein (MAP) 2, one of which intensely labels Alzheimer NFT. These findings show that one aspect of Alzheimer-type neurofibrillary pathology is an aggregation of MAP 2 or MAP 2 fragments with altered neurofilamentous elements present in NFT. (D. J. Selkoe, R01 AG01307 and AG02126)

- Dr. Selkoe recently has published the results of a study demonstrating that unique molecular markers, such as PHF antigens, previously found to be specific for Alzheimer-type neurofibrillary degeneration, are also present in the characteristic filaments of degenerating neurons in Pick's disease. This finding is important because the morphology of the neuronal fibers produced in AD and Pick's disease is usually distinct. This result suggests that the two disorders may be morphological variants of a common molecular process that causes reorganization of the fibrous neuronal cytoskeleton. (D. J. Selkoe, R01 AG01307)

- Dr. Ann Johnson reports raising four monoclonal antibodies that label Alzheimer neurofibrillary tangles. Further work with these monoclonal antibodies has led to the development of quantitative assays for determining the relative amounts of antigen present in cerebrospinal fluid (CSF). Dr. Johnson reports finding significant differences in amounts of antigen between subjects with AD and controls without neurological disease. Further studies with these antibodies may prove to be very important because of their possible usefulness for a laboratory diagnostic test for AD. (A. Johnson, R03 AG04195)

- Dr. Kenneth Davis reports the development of an instrument that would both give a comprehensive assessment of AD symptoms and be brief enough to be practical. The Alzheimer Disease Assessment Scale (ADAS) combines brief cognitive tests from a longitudinal battery with behavioral ratings of noncognitive symptoms assciated with AD. The test includes recognition tasks such as word recognition tests, word recall tasks and orientation questions to assess memory. The interrater reliabilities of the ADAS are reported to be 0.986 for AD patients and 0.890 for controls. Retest reliabilities are coefficients of correlations 0.380 for AD and 0.754 for controls. (K. Davis, P01 AG02219)

- Dr. John Blass reports that Alzheimer disease is in some sense a systemic metabolic disease - either a brain disease with systemic manifestations or a systemic disease with primarily neurobehavioral manifestations. Studies conducted by Dr. Blass and his co-workers suggest that in AD the inherent abnormality is in the ability of nerve cells to catabolize glucose, which may be a source of cell death. In a different vein, Dr. Blass also reports that his clinical studies indicate that dementia is underdiagnosed as well as overdiagnosed, that the diagnosis of a progressive dementing illness can be made with greater than 95 percent accuracy by clinical criteria, and that dementing illness can present clinically as depression. Analysis of the computerized database indicates that the course of Alzheimer disease is longer in a socioeconomically favored population than recorded previously, with 50 percent survival of 8.6 years after onset; patients with vascular dementias apparently do not live as long. Unrecognized brain damage, including cognitive impairment, appears to be remarkably common in patients with chronic cardiac disease, affecting 88 percent of those studied on the cardiac rehabilitation service at Burke. (J. Blass, P01 AG03853)

- Dr. Melvin Ball has published data to support the hypothesis that the decline of all higher cognitive functions in Alzheimer disease is due to histopathological changes in the hippocampus, with or without neurocortical neuronal lesions. Dr. Ball's results are based on a quantitative morphometric evaluation of the hippocampus from a longitudinal study of AD patients with clinical presentation of AD. (M. Ball, R01 AG03047)

- The injection of aluminum powder into the cerebrospinal fluid induces a slowly progressing encephalomyelopathy with cerebellar atrophy. Using this method, Dr. Bernardino Ghetti has been studying the causal relationship between aluminum (Al) and neurofibrillary degeneration. The mechanism by which Al induces nerve cell damage is only partially understood. But it has been found that Al binds stoichiometrically to calmodulin and induces changes in the structure of this protein. In this manner Al impairs the functioning of calmodulin as a calcium regulator. Dr. Ghetti proposes that the formation of an Al-calmodulin complex may be one of the key lesions that occurs in several syndromes of Al toxicity in animals and human patients. (B. Ghetti, R03 AG04252)

- Dr. Gary Lynch has proposed the hypothesis that certain neurodegenerative conditions associated with old age and some diseases are due to disturbances of mitochondrial calcium buffering followed by the activation of a calcium-sensitive proteinase "calpain." This enzyme degrades cytoskeletal crosslinking proteins. The results of Dr. Lynch's studies have shown that calpain activity varies across the brain. The activity of this enzyme was found to be high in those regions of the brain that show most prominent age-related anatomical changes. (G. Lynch, P01 AG00538)

- Dr. Fred Gage, in a published study, reports finding significant differences in brain glucose utilization between aged and young groups of rats. In two behavioral tests employed, one for learning and one for place navigation, the decline in performance was correlated significantly with the decrement in regional glucose utilization. Dr. Gage's study suggests that aging rats might be an important model for studying not only the normal aging process but also for studying the mechanism of cognitive decline. (F. Gage, R01 AG03766)

- Dr. William Dement and his co-workers have reported in a published paper that at least 30-40 percent of apparently healthy noncomplaining older persons show sleep-related respiratory disturbance (SRRD). The true prevalence of SRRD is not well established. The presence of SRRD in disease-free, asymptomatic, older people indicates that this phenomenon might be a common consequence of aging. (W. Dement, P01 AG02504)

Overview of Program Plans, FY 1986-1989

During FY 1986, the Neuroscience of Aging Program will focus its program development activities on the exploitation of the scientific opportunities presented by the following areas of study:

- Neural transplantation; neural plasticity; neurotrophic factors
- Protein chemistry of cytoskeletal elements, particularly that of filaments and microtubules
- Development of monoclonal antibodies for specific proteins in the brain
- Brain enzymes, particularly those related to oxidative metabolism and synthesis of neurotransmitters
- The effects of toxins and infectious agents on degenerative processes
- Genetic factors in neural degenerative processes
- Neuropharmacology of memory disorders

Planned activities related to program development during FY 1986 will include:

- An NIA/NINCDS/NIMH/AARP/NAS conference on "Heavy Metals of Trace Elements and Aging"
- A conference on the "Role of Calcium in Biological Mechanisms of Aging"
- An NIA-EURAGE-WHO Conference on "Diagnostic Criteria of Alzheimer Disease"
- Continuation of the evaluation study of the Institute's extramural Alzheimer disease research program
- Issuance of RFAs to stimulate research on the diagnosis of AD and on the role of trace elements on the aging process.

The following activities will be undertaken in FY 1987-1989:

- The evaluation study of Alzheimer disease will be completed in FY 1986. It is expected that this study will result in a set of recommendations for program initiatives. This document will be used for developing specific program plans for FY 1987.
- During FY 1986, two conferences are being planned concerning the role of heavy metals and trace elements in biological mechanisms of aging. The proceedings of these conferences will be used to issue program announcements concerning these topics in FY 1987.
- An RFA will be issued to encourage the development of more accurate and more sensitive diagnostic tools for Alzheimer disease.

- The ADRC program will have been in place for four years by 1988. An evaluation study will be designed to determine the program's effectiveness, strengths, and weaknesses.

- A cooperataive agreement will be developed in FY 1988 to initiate a multicenter study of the relationship between early clinical signs of Alzheimer disease and later biological or pathological markers of the disease.

Immunology Program

The main objective of the Immunology Program has been, and continues to be, the encouragement and support of research to elucidate age-related changes in immune function. In the past, this objective has been reached by encouraging and supporting research focused on a detailed description of the phenomena that characterize the aging immune system. More recently, however, the focus has been on research aimed at providing an understanding of the mechanisms as well as the clinical implications of these now well-documented phenomena. The endpoint of the objective is to be able to design prevention and/or treatment protocols that forestall or overcome adverse effects resulting from age-related changes in immune functioning.

Developmental Activities and Achievements, FY 1985

An index of the developmental activities of the program staff and, more importantly, of the direction of the program, is provided by the competing grants that have been funded during the past year. These grants cover the following topics:

- Age-Related Decline in Immunity to Trypanosomes (J. W. Albright, 2 R01 AG03267-04)

- Autoanti-Immunoglobulin Response and Aging (C. A. Bona, 2 R01 AG02716-04)

- Effects of Aging on the Hepatobiliary Metabolism of ICA (C. K. Daniels, 1 R23 AG04897-01A1)

- The Stem Cell-Thymus Axis in Fetal, Adult and Aged Mice (J. L. Haar, 2 R01 AG04384-03)

- Age-Associated Alterations in Human NK Cell System (R. Krishnaraj, 1 R01 AG05717-01)

- Clonal Analysis of T Lymphocyte Function in Aging (R. A. Miller, 1 K04 AG00281-01)

- Aging Effects on Il-2 Secreting T Helper Cells (R. A. Miller, 2 R01 AG03978-04)

- Immunological Aspects of Aging (E. J. Yunis, 2 R01 AG02329-04)

A meeting of an ad hoc advisory panel was held in September 1984 to evaluate the NIA contract for the study of thymic hormones at the University of Alabama.

A meeting of an ad hoc advisory panel was held in July 1985 to advise on the development of a new program initiative on "Neuroendocrine Factors in the Aging Immune System." This initiative will integrate aspects of the Neuroscience and Immunology Programs.

Research Highlights, FY 1985

- Dr. Rita Effros reports that the reduced cytotoxic T-lymphocyte response seen in aged mice following innoculation with influenza virus may be due to a defect in the antigen processing and/or presentation mechanism. (R23 AG03524)
- Dr. Edmond Yunis reports that in mice at least two genetic systems have been identified that interact with sex factors and influence longevity. According to Dr. Yunis, the identification of different genes of longevity may be applicable to research in humans and utilized to identify individuals susceptible to long and short lives. (R01 AG02329)
- Dr. Richard Miller reports that in mice the loss of precursor cells in the T-helper, cytotoxic, and proliferative responses to Con A and to proteins is characteristic of aging, and that life span extension by food restriction leads to a retardation of the rate at which precursor cells are lost for both the helper and cytotoxic lineages. Accordingly, it would appear that precursor cell loss may be a fundamental element in immunosenescence. (R01 AG03978)
- Dr. Martin Kagnoff has found that, during an antigen specific response within the intestinal mucosa of mice, additional cytotoxic responses are generated to levels not usually present in normal gut-associated lymphoid tissue. According to Dr. Kagnoff this nonspecific recruitment of unrelated immune effector cells may be of significance for the prevention of secondary opportunistic infection. If such mechanisms change with age, according to Dr. Kagnoff, there may be alterations in host intestinal mucosal immune defenses. (R01 AG03189)
- Dr. Julia Albright reports that in aging mice there is an unequivocal decline in the natural killer system of large-granule lymphocytes. This change, according to Dr. Albright, appears to be more a matter of functional impairment of natural killer cells than a numerical deficiency of them. This may be a contributing factor to the rise in susceptibility of old animals (and perhaps humans as well) to tumors and various infectious diseases. (R01 AG03267)
- Dr. Gabriel Fernandes reports that circulating autoantibodies in autoimmune-prone mice are influenced (i.e., markedly reduced) by diets that are restricted in calories only when fat content is low. Diets with a

normal caloric content but low in fat, or calorically restricted but high in fat, had no such effect. In separate studies, Dr. Fernandes found that high fat diets appear to specifically inhibit both T-helper and B-cell functions of autoimmune-prone mice. This is pertinent to understanding possible mechanisms through which longevity is influenced by caloric restriction. (R01 AG03417)

- Dr. Ronald Whisler has for the past year been studying intrinsic defects in the function of B cells and monocytes from aged humans. He reports that in a semisolid culture system the ability for staph protein A to activate B cells to form distinct colonies is commonly reduced with aging. Dr. Whisler reports that though monocytes are required for this outcome, their precise role remains unknown. Dr. Whisler has found that the expression of Fc receptors for IgG on monocytes and the ability of monocytes to produce interleuken 1 are not different in older people compared to young adults. One possibility now being examined is whether alterations in the density of human "Ia-like" antigens in monocyte subsets for older people may be related to reduced B-cell colony responses. (R01 AG03763)

- Dr. Parsottam Patel, who is studying decreased capacity of senescent mice to generate antimicrobial protective immunity, reports that in response to an immunizing infection with Listeria monocytogenes, senescent mice generated only one-tenth the number of protective T cells that young animals did. Furthermore, there was a 100-fold reduction in the efficiency of protective T cells from senescent mice compared to those from young mice in conferring anti-Listeria protective immunity. Dr. Patel has found that accessory cells from young and senescent mice are equally capable of stimulating T cells in an oxidation-induced lymphoproliferation. Furthermore, advancing age has been shown to have no notable effect in macrophage functions. (R01 AG03903)

Overview of Program Plans, FY 1986-1989

Plans for the next two years focus on establishing a strong portfolio of research involving mechanisms underlying aging changes in the immune system. A major conference that will define the areas most likely to be productive is proposed for mid-FY 1987. The conference will be planned early in FY 1986 by a group of scientists who have made substantial contributions to the area. The conference will produce a book and program announcement addressing the interests of the Institute.

There are several notable unresolved issues regarding the aging immune system that are currently being discussed in the literature (e.g., whether or not Il-2 production decreases with age, whether or not idiotypic control of B-cell specificity declines with age, and the specific locus of the effect of dietary restriction on the immune system). A workshop is proposed to convene the scientists involved in research on each of these issues in order to determine the basis of the differences (e.g., specific models used, assays employed, etc.). Following the workshop, a series of position papers will be published in order to facilitate resolution of the issues.

In the recent past, program staff has been working with members of the scientific community on an ad hoc basis to develop an interest in the interaction between the aging endocrine system and the aging immune system (e.g., to what extent do changes in one affect changes in the other, what are the possible feedback pathways? etc.). During FY 1986 and FY 1987, an RFA on neuroendocrine factors in the aging immune system will be planned and issued. This area is of much general interest, as reflected by a number of recent conferences, and needs some stimulation to focus research on the problems of aging.

Exercise Physiology Section

The mission of the Exercise Physiology Section is to develop and support basic and clinical research designed to assess the role of physical activity in the promotion of health (which includes the concept of rehabilitation) and in the prevention of premature physical decline and disease in older people. Basic biological mechanisms of adaptational responses of the nervous system, skeletal muscle, connective tissue, the heart, blood and vasculature, and the respiratory system are of particular interest. Because of the cross-disciplinary nature of the field of exercise physiology, approaches to this kind of research range from cell biology to the level of the whole organism, including not only classical in vivo research, but statistical studies of populations (i.e., epidemiology) as well. Representative research issues include the following:

- What factors influence the ability of humans to make biological adaptations to exercise, and how may these factors be influenced by the aging process?
- To what extent and under which conditions is the medical recommendation of physical activity for older persons sound?
- In the recommendation of physical activity for the promotion of health in older people, how (in terms of specific activity, intensity, duration, frequency, etc.) is advice formulated to fulfill the needs of the individual?
- Can regular physical activity prevent or delay onset of age-related disorders (e.g., hypertension, maturity-onset diabetes mellitus, osteoporosis), and, if so, how?

Developmental Activities and Achievements, FY 1985

An index of the developmental activities of the program staff and, more importantly, of the direction of the program, is provided by the competing grants that have been funded during the past year. These grants cover the following topics:

- Age, Physical Fitness, and Information Processing Speed (T. R. Bashore, 1 R01 AG04581-01)
- Impact of Physical Fitness and Exercise on Health (S. N. Blair, 1 R01 AG04157-01A2)

- Physical Training and Adrenergic Receptors in Hypertension (M. A. Berk, 1 R03 AG05479-01)
- Physiology, Cognition, and Exercise in Normal Adults (J. A. Blumenthal, 1 R01 AG04238-01A3)
- Exercise and Bone Density in Postmenopausal Women (G. P. Dalsky, 1 R23 AG05202-01)
- Physical Activity on Utilization of Dietary Calcium (B. Dawson-Hughes, 1 R03 AG05526-01)
- Mechanisms of Exercise-Induced Bone Loss Attenuation (G. C. Haidet, 1 R03 AG05830-01)
- Physiological Adaptations to Exercise in the Elderly (J. O. Holloszy, 1 P01 AG05562-01)
- Exercise as Preventive Medicine in the Aging Process (J. O. Holloszy, 2 T32 AG00078-06)
- Epidemiology of Fitness in the Elderly: A Twin Approach (R. E. LaPorte, 1 R03 AG05489-01)
- Measurement of Osteoarthritis with NMR Spectroscopy (D. B. McKeag, 1 R03 AG05858-01)
- Autonomic Function in Women: Effect of Age and Training (C. J. Porth, 1 R03 AG05831-01)
- Aging, Exercise Training and Skeletal Muscle (S. G. Thomas, 1 R03 AG05556-01A1)
- Exercise and Insulin Resistance (R. P. Tonino, 1 K08 AG00268-01)
- Age-Related Changes in Posture and Movement Preparation (H. Woollacott, 1 R23 AG05317-01)

Research Highlights, FY 1986

- In a final progress report, Dr. James Hagberg provided data to show that in healthy subjects, after differences in habitual levels of physical activity (i.e., older competitive athletes compared with young competitive athletes) were taken into account, the reduction in maximal aerobic exercise capacity observed with age was not the result of a reduction in either stroke volume or arteriovenous O_2 difference, but rather a reduction in maximal heart rate. Accordingly, it would seem that the reductions that other investigators have shown in stroke volume for healthy older people under maximal working conditions can be prevented by regular participation in exercise programs (J. Hagberg, R23 AG03038).

- Dr. Hagberg and his colleagues also provided data demonstrating that despite the fact that older competitive runners have a 9 percent lower oxygen uptake capacity, they were able to perform as well as younger runners because they were able to sustain work at a higher percentage of their capacity for performing aerobic work (J. Hagberg, R23 AG03038).

- Dr. Hagberg and his colleagues have also published, or are in the process of publishing, data that demonstrate that healthy older men and women not regularly involved in exercise programs, nevertheless, retain the biological ability to make the same kinds of cardiovascular, pulmonary, and metabolic adaptations to training as healthy young people. For example, prolonged endurance training of older people was shown to increase maximal oxygen capacity primarily through an increase in maximal arteriovenous O_2 difference. Furthermore, during standard submaximal work, stroke volume was higher, while heart rate, blood pressure, and systemic vascular resistance, plasma lactate, ventilation, and respiratory exchange ratio were lower in these same subjects as a consequence of training. Though training did not lead to changes in left ventricular contractile function at rest, it was associated with reductions in blood pressure at rest and in a lower heart rate-systolic blood pressure product during acute isometric stress (J. Hagberg, R23 AG03038).

Overview of Program Plans, FY 1986-1989:

The Exercise Physiology Section is in a developmental phase. The objective of activities in FY 1986 will be to continue to provide a focus for this program. Particular emphasis will be placed on the study of exercise as an intervention for maintaining health in healthy (i.e., nondiseased) older people. The fundamental question is to what extent, and in relation to what other variables (i.e., disease and life style), is exercise a medically reasonable recommendation for older people.

Assuming that the response to the program announcement on "Exercise Physiology," issued in February 1985, demonstrates that the exercise physiology field is sufficiently ready, an RFA in exercise physiology will be issued in FY 1987 to develop approximately ten new research projects (R01s) in exercise medicine and aging.

Exercise physiology and exercise medicine are often associated with physical medicine and rehabilitation. By 1988 the Exercise Physiology Section should be in a position to broaden its base by developing new initiatives in physical medicine and rehabilitation. The approach will be to convene a planning workshop on the topic and issue a program announcement.

Geriatrics Branch (GB)

The mission of the Geriatrics Branch is to support research on clinical problems that occur predominantly among older people or that are associated with increased morbidity and mortality in this age group; to promote research on clinical problems associated with nursing homes and other sites of long-term care for older people; and to support the development of investigators in geriatrics and other areas of aging research through training and research support for junior clinical investigators and established investigators entering the field of aging.

Cardiovascular/Pulmonary/Renal Program (CPR)

The mission of this program is to develop and support research on problems such as alterations in blood pressure regulation with age, isolated systolic hypertension, orthostatic hypotension, aging changes in the microcirculation, age-associated alterations in vital capacity, and emphysema.

Developmental Activities and Achievements, FY 1985

CPR held a joint workshop with NHLBI on atherosclerosis and aging in July 1985. The workshop focused on the interaction of aging with the progression of atherosclerosis and included epidemiologic, clinical, and experimental perspectives. The purpose of the workshop was to identify worthwhile topics for further research.

CPR staff is serving on the planning committee for an NHLBI-sponsored workshop on coronary heart disease in older people. This workshop will focus primarily on clinical aspects of coronary heart disease, including special problems of diagnosis and treatment in the older population. It will also identify important areas for research.

The NIA, in conjunction with NHLBI, is cofunding a major clinical trial on the treatment of systolic hypertention in the elderly population (SHEP). The primary hypothesis is centered on the impact of treating isolated systolic hypertension on stroke morbidity and mortality. There are also hypotheses related to the effect of treatment on cardiovascular mortality, all-cause mortality, and the quality of life. Seventeen clinical centers and one coordinating center have been funded to recruit and treat 5000 older persons in a double-masked, randomized, clinical trial research design.

In FY 1985, the principal investigators, research teams, and NHLBI and NIA program staff (both BRCM and BSR) met four times to develop the protocol for the full-scale trial. The meetings were organized by work groups to address particular aspects of the protocol development and research plans. A CPR staff member served on the Recruitment and Adherence Subcommittee and assisted in the development of the national recruitment materials, including radio and television public service announcements, patient recruitment brochures and fact sheets, an article for publication in the *Journal of the American Medical Association*, and letters of information sent to all the member organizations of the Leadership Council on Aging from the NIA and NHLBI Institute Directors. Another CPR member participated in the Endpoints and Toxicity Subcommittee and was instrumental in the development of criteria for the determination of multi-infarct dementia. These two staff members also serve on the Executive Committee and Steering Committee.

In addition, NIA and NHLBI program staff have instituted a regular monthly meeting for the purpose of keeping all sponsors informed about the wide range of activities required for the management of such a large clinical trial.

A meeting of all the centers and the NIA and NHLBI program staff was held in September to present the unmasked data from the pilot study to the public.

Finally, discussions have been held with principal investigators to obtain their ideas for possible ancillary or add-on investigations to the full-scale trial, including risk factors for hip and Colles fractures, bone loss and thiazide diuretics, and neuropathological determinations of all deaths during the trials.

Research Highlights, FY 1985

- Researchers at Harvard University have shown that patients with high blood pressure tend to have greater drops in pressure when standing than do patients with normal pressure. Thus, syncope may be an additional, and previously unsuspected, consequence of high blood pressure in older persons and might, in some cases, be prevented by antihypertensive treatment, rather than be aggravated by such treatment as has generally been assumed. (Lipsitz, K08 AG00213; Rowe, P01 AG04390)

- Age-related increases in plasma cholesterol appear to contribute significantly to cardiovascular disease. These increases are seen in both humans and rats. Studies in rats have found that the rise in cholesterol may be related to decreased activity of two enzymes (cholesterol acyltransferase and lipoprotein lipase) which affect the relative amounts of cholesterol in tissues and the circulation. (Lacko, R01 AG03255)

- Although several papers on the pilot study of the SHEP trial have been published, the first report of the unmasked blood pressure data is still in press--(The Systolic Hypertension in the Elderly Program (SHEP): Antihypertensive Efficacy of Chlorthalidone, Hulley et al., in press in the Journal of the American Medical Association. The important findings are:

  (1) Chlorthalidone reduces systolic blood pressure in older persons. Systolic pressure was reduced to 160 mm or less in 88 percent of treated subjects with a dosage of 25 mg per day.

  (2) The yield of randomized patients from all those with any contact at the screening sites is 2 percent. Of those persons screened, 39 percent were taking antihypertensive drugs.

  (3) Compliance with both active medication and placebo regimens was high (85%). The three measures of compliance were in quite good accord.

(4) Older people can be recruited, are willing to participate, and will comply with treatment regimens in a large-scale clinical trial.

(5) The adverse side effects of chlorthalidone are small and manageable and include modest, asymptomatic reductions in serum potassium, higher levels of uric acid, and reductions in creatinine clearance.

(6) The data on stroke mortality and morbidity by treatment and placebo group will be available in late 1985.

Overview of Program Plans, FY 1986-1989

The 1984 NIA-NHLBI workshop on "Blood Pressure Regulation and Aging" identified several important areas for research, including mechanisms for the age-associated rises in basal systolic and diastolic pressures, age-related changes in homeostatic mechanisms responsible for the increased incidence of postural hypotension and syncope in older people, the effect of nutrition and other environmental factors over the life span on changes in blood pressure with age, and the effects of connective tissue changes with age on arterial wall compliance and systolic hypertension. NHLBI staff have proposed an RFA on blood pressure regulation and aging to be issued for funding in FY 1986. NIA proposes to share support of this RFA equally with NHLBI.

For many years, it has been held that age-related stiffening of the aorta is responsible for increases with age in systolic blood pressure. However, direct evidence confirming this relationship has been mostly lacking. Recent advances in cardiovascular diagnostic techniques now make it possible to relate aortic compliance to blood pressure more directly. In addition, there has been continuing progress in connective tissue biochemistry that has opened new opportunities for research on the causes of aortic stiffening. A workshop on "The Aging Aorta" has been proposed for FY 1986. It would include clinical cardiovascular researchers, physiologists, pathologists, cell biologists, and biochemists and focus on needs for research on the causes and effects of age-related changes in the aorta. The workshop would help to determine whether an RFA or similar initiative from NIA is needed.

Endocrinology Program

The main objectives of the Endocrinology Program are to encourage and support research on the age-related changes in endocrine function, the mechanisms underlying these changes, and the impact of these changes on other physiologic systems.

Developmental Activities and Achievements, FY 1985

In December 1984, the Geriatrics Branch organized a planning session to consider ideas for a research workshop on catecholaminergic systems and aging. The group's consensus was that a workshop on this topic would be useful. Several important general topics were identified: age-related changes in sympathetic efferent activity, changes in tissue sensitivity to catecholamines, and physiologic and pathophysiologic consequences of age-related alterations in catecholamine actions on cardiovascular function and metabolism.

Research Highlights, FY 1985

- o Glucose can nonenzymatically bind covalently to proteins. These bonds have been demonstrated to accumulate in myelin protein and appear to lead to crosslinking of myelin proteins. Because myelin is a very long-lived protein, these protein alterations can accumulate over time and may play a role in the peripheral neuropathies associated with diabetes and aging. (Vlassara, K01 AG00148)
- o The proportion of males with significantly reduced plasma levels of somatomedin C increases with age. These decreases could play a role in age-related degenerative changes in muscle and cartilage. (Florini, AG00629)
- o There is considerable evidence that insulin-stimulated glucose disposal is reduced with age. A study indicates that the variance in insulin sensitivity from person to person is approximately doubled in subjects above the age of 54 years. It is hypothesized that since recent evidence has demonstrated a significant correlation between in vivo response to insulin and habitual physical activity (as estimated by maximal aerobic capacity) in humans, the increased degree of variance seen in insulin action in older humans is related to individual differences in level of habitual physical activity. (G. Reaven, P01 AG01312)

Geriatric Research and Training Program (GRT)

This program supports clinical research on disorders that are concentrated predominantly among older people or that are associated with increased morbidity and mortality in this age group. In addition to the preceding specific clinical problems, this program also addresses the problem of the lack of research on clinical problems in nursing homes and other sites of long-term care for older people. Another mission of GRT is to attract new investigators to the field of aging and to further the development of active investigators in clinical medicine and biological research.

Developmental Activities and Achievements, 1985

Staff from GRT and other NIA programs met with principal investigators and staff of NIA Teaching Nursing Home (TNH) projects to exchange ideas on NIA policies and future initiatives regarding the TNH program.

The proceedings of a symposium organized by BRCM on problems of conducting clinical research with older persons (held at the Annual meeting of the American Geriatrics Society in May 1984) will be published in The Annals of

Internal Medicine. A GRT staff member is a coauthor of the forthcoming paper.

Research (and Training) Highlights, FY 1985

- The number of NIA Teaching Nursing Home projects increased to seven in FY 1985. Several important findings have come from these projects: Two Teaching Nursing Home projects are studying respiratory function in older people. Impaired respiration is involved in sleep apnea, a common condition among older people in which breathing ceases for brief periods during sleep. This condition places subjects at increased risk of mortality. Researchers at the Teaching Nursing Home project at The Johns Hopkins University have found that sleep apnea in older persons is related to decreased respiratory muscle strength. Researchers at the Case Western Reserve Teaching Nursing Home have found that such age-related decreases can be reversed by training programs. In addition, the Johns Hopkins group has shown that weight loss can reduce apnea in obese older patients. (Hazzard, P01 AG04402; Ford, P01 AG04391)

- Researchers at the Teaching Nursing Home project at Albert Einstein College of Medicine have found that some older persons suffer drastic losses in strength in specific leg muscles and/or lose accurate sensation of leg position and that these persons are at markedly increased risk of falling. The identification of such specific factors may eventually lead to effective ways of preventing falls by reversing or compensating for these dysfunctions. (Wolfson, P01 AG03949)

- Vitamin D is required for maintenance of adequate bone density, and inadequate levels of vitamin D appear to increase the risk of hip fracture. Part of the body's vitamin D supplies are made in the skin in response to sun exposure. Researchers at an NIA Teaching Nursing Home project at the Hebrew Rehabilitation Center and Harvard University have found that the capacity of the skin to make vitamin D is diminished in older people. This may have implications for recommendations concerning nutrition and sun exposure for older persons. (Rowe, P01 AG04390)

- The individual and institutional Physician Scientist Awards were designed to train clinicians interested in aging in the skills required for independent research and to provide research experience in a fundamental science. The award allows for two years of didactic study and laboratory experience under the direction of a senior sponsor. The first 2-year phase is then followed by 3 years in which the laboratory-based research is applied to a basic science or clinical research question. The award allows for a salary of $40,000 and a research allowance of $10,000 in Phase I and $20,000 in the last 3 years. In FY 1985, one individual Physician Scientist Award application and two institutional Physician Scientist Award applications were submitted; one institutional award was funded.

- In late FY 1984 the NIA announced the Complementary Training Award for Research on Aging. This award follows the guidelines of the Institutional National Research Service Award (NRSA). It is designed to allow institutions with an ongoing training program funded by another Institute to submit an abbreviated application for adding a research training program in aging. In FY 1985 one such award was funded at Stanford University.

- The Geriatric Leadership Academic Award was announced at the end of FY 1984. It invites academic health centers and other health professional schools to submit applications for the support of leadership activities in the development of research and research training in aging. This, in contrast, to the discontinued Geriatric Medicine Academic Adward and Geriatric Dentistry Academic Award, is not an award for curriculum development. It is an award, through an identified faculty catalyst, to develop an environment conducive to and encouraging of faculty and student research. Nine applications were reviewed, of which two were funded, one at the University of Michigan and one at Case Western Reserve University.

- Procedures are being developed for the NIA to fund approved but unfunded training positions on training grants paid by other Institutes. The positions so funded by NIA must be filled by a trainee whose focus and program will be in aging research. During FY 1985, 14 such positions were funded, 6 in demography, 1 in respiratory disease, 1 in cardiovascular epidemiology and prevention, and 6 in veterinary pathology.

Overview of Program Plans, FY 1986-1989

An RFA for research on "Physiologic and Pathophysiologic Changes in Very Late Life" is planned for FY 1987. Mortality rates continue to rise throughout the ninth and tenth decades of life. Many age-associated medical conditions, such as Alzheimer disease, urinary incontinence, and prostatic cancer, also continue to rise in incidence during the ninth decade and probably thereafter. Physiologic changes during this part of the life span may contribute to increased risk for specific diseases and increased mortality from various diseases. However, most studies of human physiologic changes with age have included few subjects over 80 years old, and even fewer have selected representative samples of the overall population in this age category. Data on physiologic changes in this part of the life span could help to increase understanding of factors predisposing to diseases with high rates of onset in the ninth and tenth decades and of factors predisposing to increased mortality from various causes in the very old. Data are needed both on disease-free subjects and on persons with various chronic diseases of aging in order to understand the interactions between multiple disease processes in individual patients that occur so frequently in the older population. A planning meeting and an RFA are proposed for one or two large comprehensive studies of changes in multiple functions within populations to allow analyses of the interrelationships of these changes.

Genitourinary Disorders Program (GUD)

The mission of the program is to support and develop research on the epidemiology, pathophysiology, diagnosis, and therapy of urinary and fecal incontinence, prostatic hypertrophy, and impotence.

Developmental Activities and Achievements, FY 1985

The major developmental activities of FY 1985 in the Genitourinary Disorders Program have centered on the coordination and fostering of clinical trials of behavioral therapies of urinary incontinence, cofunded by the Division of Nursing (DN), HRSA. Because the clinical trials are funded by cooperative agreements, BRCM and BSR program staff have played an important role in the scientific development of each trial.

Even more important, however, have been the efforts to coordinate and integrate the data collection among the sites. In early FY 1985 a group of experts in the fields of urinary incontinence and urodynamics, behavioral sciences, nursing, biostatistics and clinical trials methodology, geriatrics, and aging generally were identified. The experts were then invited by the NIA Director and HSRA administrator to form the Monitoring Group for the clinical trials. This group makes recommendations on design, methods, and analytic procedures to the NIA, the DN, and the principal investigators for the duration of the clinical trials.

The Monitoring Group consists of a chairperson and six members who are appointed, two nonvoting ex-officio members, the NIA Project Officer, and the DN Co-Project Officer. Meetings of the Monitoring Group will be called by the chairperson at least twice a year. Monitoring Group meetings will be attended, when appropriate, by senior representatives from the trial sites. Specific functions of the Monitoring Group are:

(a) To review the operations manuals prior to the entry of patients into the trials.

(b) To review the course of the trials and to make recommendations to the NIA/DN program staff on their progress and performance, including suggestions regarding any site that performs unsatisfactorily.

(c) To make recommendations to the NIA/DN staff on any proposed early termination of any trial because of beneficial or adverse treatment efforts.

(d) To resolve problems referred by the NIA/DN program staff or the principal investigators.

The Monitoring Group met in February 1985 to review the operations manuals of four of the sites before patient recruitment was initiated. Each of the manuals was approved with a few specific recommendations, and the sites proceeded to the patient recruitment phase.

The second meeting of the Monitoring Group was held in May 1985. At that time, the operations manual for the fifth clinical trial site was reviewed. Additionally, recruitment progress to date, analytic plans, and proposals for discontinuance of specific data-gathering activities at each site were addressed.

Three intersite meetings of the clinical trials research teams were held this year. The first meeting in December 1984 included principal investigators and NIA and DN staff. The goals were to exchange information and to determine where common procedures and instruments could be used at all sites. The second meeting in January 1985 included the principal investigator at each site plus several key members of his/her research team. The discussions of common procedures and instruments were expanded substantially. The third meeting was held in May 1985 in conjunction with the meeting of the Society for Clinical Trials and focused on recruitment progress and problems encountered to date.

Infections/Hematology/Oncology Program (IHO)

The IHO supports research on the relationship of physiologic changes associated with age or chronic disease to susceptibility to infections, hematologic problems, and neoplasia. Other specific priorities of IHO include: new strategies for evaluating vaccine efficacy in older people, potential new prophylactic techniques for infections in this age group, age-related changes in the effects of stresses such as chemotherapy, radiotherapy, and infection on granulopoiesis and lymphopoiesis, age-related changes in circulating levels of amyloid proteins and effects of amyloid deposition, and the interaction of aging and processes of carcinogenesis.

Developmental Activities and Achievements, FY 1985

In October 1984, at the Twenty-Fourth Interscience Conference on Antimicrobial Agents and Chemotherapy, the IHO program cosponsored a symposium on "Aging: Immunity and Infection," which was attended by over 300 persons. Topics included an overview, polymorphonuclear leukocyte function, immune function, urinary tract infection, and pneumonias and infections in nursing homes.

Research Highlights, FY 1985

- In a study investigating thirty older subjects' antibody response to influenza vaccination, it was found that antibody response both in vitro and in vivo was significantly less in the older subjects compared to that in thirty inoculated young subjects. Approximately 1/4 of the older subjects did not have a significant antibody response at all. It was also found that the addition of thymic hormones to lymphocyte cultures augmented specific antibody synthesis in over 1/2 of the cultures established from the older subjects, but had a much less striking effect in cultures from the young subjects. Futhermore, it appeared that lymphocytes from subjects most deficient in antibody response were the ones most affected by thymic hormones. (W. Ershler, K08 AG00214)
- The usefulness of two pneumococcal antigen (PCA) detection tests, latex agglutination (LA) and counterimmunoelectrophoresis (CIE), for diagnosing pneumococcal pneumonia was assessed in older subjects. Serum and urine samples were collected from 68 older patients with confirmed or suspected

pneumococcal pneumonia. LA was considerably more sensitive than CIE in detecting PCA. Both tests detected PCA more often in urine specimens than in serum specimens. Despite antibiotic therapy, LA and CIE detected PCA in the urine of 92 percent and 46 percent of definite cases, respectively. The results suggest that latex agglutination may be a useful addition to techniques for diagnosing pneumonia in older subjects. (D. Bentley, R01 AG03795)

Overview of Program Plans, FY 1986-1989

The incidence of many malignancies increases with advancing age. In addition, interventions that increase life span in experimental animals also retard the onset of malignancies, suggesting a common link between processes of aging and of carcinogenesis.

Current basic research on aging and carcinogenesis also shows some striking parallels: In both fields, there is active exploration of the pathologic effects of acquired genetic damage, free radicals, defects in immune surveillance, and postmenopausal endocrine changes. In both fields, recent advances in molecular biology have allowed detailed examination of alterations in specific DNA sequences. As noted in a conference supported by NIA and the National Cancer Institute (NCI), data from these approaches in the study of aging are almost certain to increase understanding of carcinogenesis and vice versa. Preliminary discussions with NCI staff indicate that collaboration on both basic and clinical research would be useful. Therefore, a workshop on "Aging and Cancer" is planned for FY 1987 to explore fruitful lines of research, to be followed by an RFA (to be supported equally by NCI if possible) for research in this area in FY 1987.

Musculoskeletal Program (MSK)

The mission of the MSK program is to develop and support basic and clinical research on age-related changes in function of bone, muscle and cartilage. The program supports research on risk factors, prevention and treatment of falls and hip fractures in older people, as well as research on osteoporosis and osteoarthritis.

Developmental Activities and Achievements, FY 1985

There were two major developmental achievements in this program in FY 1985. A monograph, Falls in the Elderly: Biologic and Behavioral Aspects, edited by BRCM and BSR staff, was accepted for publication. The monograph is a compilation of the invited papers from the workshop of the same name that was convened in FY 1984. The monograph is an important contribution to the development of research on falls because it collects the available research findings and links hypothesized risk factors from a wide spectrum of scientific perspectives.

The second major developmental activity to be completed in FY 1985 was the issuance of an RFA for research on the biologic and biomedical aspects of falls in older people. The RFA will focus on age-associated neurologic and cardiovascular dysfunctions associated with falling. The long-term goal is to bolster the knowledge basis on mechanisms of falling, risk factors for various types of falls, and characteristics that are protective against injury and fracture when a fall occurs.

A workshop to be jointly sponsored by NIA and NIADDK on osteoarthritis was held in July 1985. It involved approximately 70 participants and set a research agenda on this topic. One or more RFAs may be based on this workshop.

Research Highlights, FY 1985

- In studying the pathogenesis of osteoporosis, investigators have found that cortical bone mass in patients with Type 1 diabetes was decreased relative to normals. During a three-year follow-up period, the overall deficit did not increase or decrease. Altered levels of serum metabolites also persisted throughout the study period. The amount of bone mass deficit was not found to correlate with diabetes control. However, an increase in bone mass in postmenopausal women with Type 2 diabetes relative to nondiabetics was also found. The difference persisted even after the investigative team statistically controlled for difference in obesity. (S. Hui, R01 AG04518)

- Metabolic clearance and production rates and aromatization of androgens to estrogens in postmenopausal women with vertebral crush fractures were compared to similar measurements in a comparable population of post-menopausal women who did not have vertebral crush fractures. It was found that postmenopausal women with vertebral crush fractures have a decrease in their testosterone blood production rate and in the amount of androgen available. Since androgens have been postulated to stimulate vertebral growth in young people, it is possible that the lower androgen production rates may play a role in the etiology of the crush fractures. (C. Longcope, R01 AG02927)

- Investigators have found that osteoporotic patients' bone loss can be reversed (not just arrested) if 1,25-$(OH)_2$ vitamin D therapy is supplemented with small doses of parathyroid hormone. This therapy dramatically improves calcium balance and increases both trabecular and cortical bone, results not obtained when either hormone is given alone. (R. Neer, R01 AG03418)

Overview of Program Plans, FY 1986-1989

The focus of activities will be on active dissemination of information about the need for and scientific opportunity in research on falls by older people. In conjunction with NIADDK, an RFA on osteoarthritis may be developed in FY 1986.

Nutrition/Metabolism/Gastroenterology Program (NMG)

The mission of this office is to develop and support basic and clinical research on effects of nutritional factors throughout the life span on longevity and age-associated morbidity; assessment of nutritional status in older persons; effects of aging on nutrient digestion, absorption, and utilization; and the contribution of nutritional status to the etiology and pathogenesis of diseases prevalent in older people.

Developmental Activities and Achievements, FY 1985

An NMG staff member chaired a session at a symposium on "Oxygen Radicals and Aging" organized and sponsored by BRCM at the University of California, San Diego, in February 1985. The session featured presentations on the role of metabolic processes in generating free radicals and the role of dietary antioxidants in protecting against free radical damage.

Program staff is preparing a chapter on nutrition and aging for the upcoming Surgeon General's Report on Nutrition. The chapter will focus on nutritional factors affecting longevity and morbidity in late life and on nutritional needs of older individuals.

Research Highlights, FY 1985

o In a study of middle-class, community-dwelling older people, researchers found that many of these people had marked deficiencies in vitamin D and calcium status. In the study population, 61 percent of women and 50 percent of men were consuming less than half the RDA for vitamin D. Mean levels of plasma 25-hydroxy vitamin D were approximately half that in younger subjects. Seventy-five percent of women and 55 percent of men consumed less than the RDA for calcium. These findings reinforce indications that dietary factors are important in the pathogenesis of osteoporosis and osteomalacia in older persons. (Garry, R01 AG02049)

o For many years, it has been known that dietary restriction extends the life span in laboratory rodents. Recent research results have given further clues about the mechanism of this effect. Though some earlier results suggested that restriction of protein intake might be the critical factor in dietary restriction, it appears that, at least in the Fisher 344 rat, protein restriction in the absence of overall caloric restriction delays the onset of cardiomyopathy and nephropathy, but not of neoplasms, whereas caloric restriction delays the onset of all three pathologies. This suggests that more than one mechanism may be mediating the effects of dietary restriction. In addition, recent findings suggest that once a stable weight is achieved, daily caloric intake per gram lean body mass is the same in restricted and ad libitum fed animals. If this is true, it indicates that extension of life span by dietary restriction is not mediated by a general slowing of cellular intermediary metabolism, and that more complex interactions at the tissue, organ, or organism level may be operating. This group has also found that dietray restriction begun after sexual maturity prolongs life span in rats equally as effectively as dietary restriction in early life. This parallels similar findings in mice, and confirms that the life span-extending effect of dietary restriction does not depend on the delayed maturation seen in animals whose diets are restricted immediately after weaning. (Masoro, P01 AG01188)

o The xylose absorption test is widely used as an indicator of the gastrointestinal tract's ability to absorb a variety of nutrients. A careful study of healthy men aged 32 to 85 indicates no change with age in either the extent or rate of xylose absorption, and suggests that previous findings indicating a decline were based on improperly designed studies. (Mayersohn, R01 AG03460)

Overview of Program Plans, FY 1986-1989

The program proposes to issue an RFA for "Special Emphasis Research Career Awards (SERCAs) for Research on Nutrition and Aging." There is a severe shortage of well-trained investigators on nutrition and aging. The SERCA mechanism appears to be a useful means of supporting the development of such researchers. These awards would permit persons committed to research on nutrition and aging to acquire needed research techniques in nutrition, as well as in related fields such as metabolism and biochemistry, while initiating research on important problems in aging.

Molecular and Cellular Biology Branch (MCBB)

The Molecular and Cellular Biology Branch includes three programmatic areas: Cell Biology, Genetics, and Molecular Biology. The overall objective of these programs is to elucidate the biochemical, physiological, genetic, and molecular events that lead from gene action to phenotypic expression. The objectives of MCBB are all related to understanding normal DNA functions and the alterations in these functions that can be induced by interaction with the environment and disease processes. Studies include investigations of gradual or programmed alterations of structure and function that characterize normal aging, as well as investigations of the abnormal changes that are characterized by age-related disease states.

The emphasis in all three programs is coordinated to provide a concerted attack on mammalian mechanisms of aging. This increase in mammalian emphasis does not preclude lower organism research. Lower organism research (e.g., Drosophila, C. elegans) that is legitimately related to aging continues to be supported and is providing important insights.

The activities of the three programs are also coordinated to provide a strong research thrust into the identification and validation of biomarkers of aging that are much needed to test interventions in aging processes and as tools for basic research.

The branch currently shares program staff with the Office of Biological Resources and Resource Development. The overall objectives of this office are to provide cell lines and aging animals for research at a reasonable cost and to explore the development of new animal models for research on aging.

Animal Models Program and Office of Biological Resources and Resource Development (ORD)

The major objectives of the Animal Models Program are to identify and develop needed new animal models (mammalian and lower organism) for use in aging research. The major objectives of the Office of Biological Resources are to characterize new and existing models (longevity, pathology, relevance to human aging), to provide animal and other biological resources to investigators who are not able to provide their own, or where possible, to produce these resources at higher quality standards and/or at lower costs.

For the last decade NIA has worked to establish a reliable supply of high quality, genetically defined rodents to satisfy the basic needs of a large portion of NIA grantees. This effort has been very successful. The supply of rodents is now assured into the early 1990s. Given this stable base, NIA can now turn its attention to the development of less universal but nevertheless important model resources, including dog and cat colonies and expansion of primate colonies. Resources of small animals (e.g., gerbils, hamsters and rabbits) will also be encouraged.

Developmental Activities and Achievements, FY 1985

The number of successful grants in this program has remained quite small, primarily because the descriptive nature of many applications for projects in animal model development does not receive very favorable attention from NIH initial review groups.

Several contract activities begun in FY 1984 were completed during FY 1985. New contract activities were also begun during the year to develop resources in models not previously provided by NIA, and program staff is hopeful that they can be completed during FY 1986. The nine-year contracts for the provision of aged mice and rats that were initiated in FY 1983 are now well underway and functioning smoothly. By the termination date of the last rat contract, the animal inventory level of that contract had reached zero, attesting to the demand by the research community for this animal model. Initiatives to provide a hybrid rat resource, establishment of a rodent biomarker resource, and development of a frozen embryo bank for important rodent genotypic groups from NIA resources were all completed during FY 1985. Pathology monitoring of the hybrid rat colony will be established in FY 1986.

The aged hybrid rat resource is expected to solve a longstanding problem. Each of the commonly used inbred rat stains (e.g., F344, Wistar, Sprague-Dawley) has a relatively high incidence of some strain-specific pathology that renders it unsuitable for certain types of research. The hybrid rat (F344 x Brown Norway F1) to be provided by this contract has fewer pathology problems than any other rat genotype examined. This genotype should become a widely used standard for aging research relatively quickly after it becomes available in mid-FY 1988.

The rodent biomarker resource contract will provide the central resource colony of inbred and hybrid rats and mice to be used in NIA-sponsored contracts and cooperative agreements for biomarker development and testing. This strategy will insure that a common pool of genetically defined, specific pathogen-free animals raised on carefully defined and controlled diets will be available for almost all NIA-supported biomarker research. This degree of standardization will resolve many of the uncertainties that currently exist in biomarker research because of the great variance in all of these factors among laboratories.

One of the problems with all animal models research that uses short-lived, genetically defined strains is that these genotypes evolve genetic differences rather rapidly due to the accumulation of mutations. As a result, it is often difficult to compare research done with a single genotype at two periods of time, since the genotypes may no longer be comparable. To solve this problem (and other genetic maintenance problems as well) NIA has established a bank for frozen embryos of important genotypes. Genotypes will be entered into the embryo bank on a regular basis and will be available for development into a small breeding group. This new technology will allow NIA to "arrest evolution" and make representatives of animals available for use by scientists at any time from FY 1986 on at very small cost. This strategy will solve many current problems inherent in longitudinal research and will probably provide opportunities that are not yet apparent.

During FY 1985 the opportunity arose to obtain middle-aged rhesus monkeys at no cost, as a result of the termination of a DRR primate center contract. NIA has selected 100 females and 20 males in the age span of 16-18 years of age. These monkeys are now housed at the Delta Primate Center in Covington, Louisiana. They provide an important new aspect to the animal resource program because they will be available for shipment to researchers for the conduct of invasive types of research.

Also during this past year the supervision of the NIA Set-Aside Primate Colony was transferred from NIA's Behavioral Sciences Research Program to the Office of Biological Resources. These animals, housed at the four Regional Primate Research Centers, are available only for noninvasive on-site studies.

Research Highlights, FY 1985

Research highlights for this program for FY 1985 are in the form of anticipation for FY 1986. As previously stated, animal models proposals have not fared well in study section review; however, with the award of 6 small grant awards in FY 1985, there hopefully will be progress to report next year. In addition, six training slots with gerontological emphasis on veterinary medicine and animal pathology were "cofunded" with DRR under the new NIA cofunded training award mechanism described in a previous section. This is a pilot effort to train individuals who will have an appreciation of gerontological issues in animal model related areas. Hopefully, such individuals will then be available to help design and carry out better conceived gerontological studies.

Overview of Program Plans, FY 1986-1989

The development and characterization of animal resources is the key to a strategy of program development for MCBB. In their early stages some other NIH Institutes and Divisions used the center grant mechanism as a development tool. This program is accomplishing the positive programming aspects of the center concept by creating resources supported by grants or contracts and surrounding them with research and training activities funded through research project (R01), program project (P01), and training grant (T32) awards. The basic outline for development calls for the training of researchers with "gerontological awareness" through NIA training grants and DRR co-funded training grants and by the provision of well-characterized biological resource materials (animals, cultures, etc.) with which to conduct their research.

NIA staff is frequently called upon to provide advice to investigators and their institutions as they approach the problems of providing new or expanded facilities. A major program priority in FY 1987 will be the development of authoritative recommendations in a format that can be easily transmitted to concerned investigators and institutions.

Many investigators have an interest in aging research, but use animal models that are not presently available at advanced ages. The provision of more diverse models will continue to be evaluated. Program staff will continue to work toward providing those models judged to be high priority, using either grant or contract mechanisms, as appropriate.

The creation of "centers" for animal model research, an animal core surrounded by research and training grants, will be a developmental target for the future. It is anticipated that such centers will be located in academic settings and will have laboratories that specialize in research using animal models and the animal colonies that provide the experimental material. The centers will have laboratories for the diagnosis of infectious disease and for monitoring the quality of the animals. They will also have a training component for new investigators.

Cell Biology Program

The broad objectives of the Cell Biology Program are to understand how cells perform their functions within a multicellular organism and how these functions change with age, to study fundamental cellular processes that are likely to be important in aging, and to identify the specific cellular changes that underlie the physiological manifestations of aging. The Cell Biology Program encourages studies on the mechanisms of cellular aging utilizing the technologies of cell culture, somatic cell genetics, and cell and tissue transplantation. The study of cells as they "age" in culture and of cells derived from humans and experimental animals of varying ages permits investigation of cellular events consequent to aging, independent of the complexity of the whole organism. The use of differentiated cells in culture is encouraged because they provide an excellent opportunity to study age-associated alterations in differentiated functions that are expressed by cells in vitro. Such studies could lead to an understanding of mechanisms of age-related functional decline in various tissues and organs. More specific program objectives are:

- To determine the mechanism for control of cellular proliferation and the limited replicative life span of normal somatic cells and to elucidate the significance of this limitation for various processes of aging.

- To identify specific cellular changes that underlie the physiological manifestations of aging.

- To determine how cells interact with each other and their environment as various elements in this interaction undergo changes with age.

- To determine the mechanism for expression of differentiated functions and for changes in these functions with age.

Developmental Activities and Achievements, FY 1985

Developmental activities continued to focus on the Aging Cell Repository. During this past year, tissue (fibroblast) and lymphocyte cultures from over 100 individuals in two families expressing familial Alzheimer disease have been added to the repository. Efforts to add cultures of animal origin that span the spectrum of maximum life expectancy are also continuing. These specimens have been obtained from nonhuman primates of varying maximum life expectancies and from canines and equines.

Research Highlights, FY 1985:

- Dr. Robert Gracy is studying the alteration and degradation of triose phosphate isomerase in human fibroblasts. He has determined the entire amino acid sequence of the enzyme and has demonstrated that the asparagines at positions 15 and 71 deamidate spontaneously to aspartic acid, whereas asparagines at other positions are stable. These two residues are at or near the contact points between enzyme monomers, and when all four deamidations occur, the dimeric enzyme dissociates into monomers. These deamidated monomers are then rapidly degraded by intracellular proteases. Deamidated forms of other enzymes have previously been shown to accumulate during aging, suggesting that this may be a general mechanism for ridding cells of altered enzymes. This turnover appears to be attenuated in fibroblasts isolated from patients with progeria and Werner's syndrome, two diseases of premature aging (R01 AG01274).

- Several research groups have proposed the existence of one or more senescence proteins that block cell proliferation. If such proteins exist, it is of the utmost importance not only to isolate and characterize the proteins, but also to understand how their synthesis is regulated. James

Smith has postulated the existence of these proteins from experiments on the control of cell proliferation in hybrids of young and senescent human fibroblasts. Senescent cells are unable to divide, and the hybrid cells are also unable to divide, suggesting the presence of a factor in the senescent cells that inhibits cell division. When young cells are fused with young cells, normal cell division continues. If the senescent cells are treated with puromycin or cycloheximide at least two hours before fusion, they no longer inhibit cell division. Inhibition can also be achieved by microinjecting messenger RNA from senescent cells into young cells. From these results Dr. Smith has concluded that senescent cells continuously synthesize one or more proteins that inhibit cell division (R01 AG04749).

o The existence of the putative senescent proteins is also under investigation in the laboratory of Eugenia Wang. Dr. Wang has prepared monoclonal antibodies to proteins from senescent fibroblasts and has identified one that reacts with a protein in the nuclei of senescent cells but not dividing cells. The protein recognized by the antibody has a molecular weight of 57,000 daltons and is present in the nuclear plasma and a region of the nuclear envelope. Dr. Wang has named this protein "statin" and is attempting to purify the protein and determine its properties and mode of action (R01 AG03020).

o Vincent Cristofalo and his colleagues are using hormones and growth factors as probes of the regulation of cell profliferation and the loss of reponsiveness to those signals by senescent cells. The epidermal growth factor (EGF) binds to a receptor on the surface of a human fetal lung cell line and thereby stimulates cell division. This receptor is composed of two proteins with molecular weights of 145,000 and 165,000 daltons. When EGF binds to the receptor, these proteins are autophosphorylated by a tyrosine-specific protein kinase activity. This autocatalytic kinase activity is not active when the EGF receptor is isolated from senescent cells, although it will phosphorylate alternate substrates such as histones. This finding suggests that the EGF receptor is altered in senescent cells so that it no longer is a substrate for the kinase. This effect has been demonstrated in six independent cell lines (P01 AG00378).

Overview of Program Plans, FY 1986-1989

During FY 1986 the program will continue to investigate the cellular changes that underlie the physiological manifestations of aging. Such studies will include research on the existence of senescence proteins that block cell proliferation and of the factors that cause senescent cells to lose responsiveness to signals that stimulate proliferation in younger cells.

The banking of tissue cultures of dermis and lymphocytes from families that show clear clinical indication of familial Alzheimer disease will continue at the Aging Cell Resposity. Also, the continuing implementation of a prospective plan for expansion of the Aging Cell Repository as proposed by the Cell Advisory Committee will be of high priority.

Efforts will be made to continue to expand the matrix of cultures available to the research community with regard to species, cell type, potential maximum life span of donors and developmental stage of donor at time of biopsy. Efforts will also be continued to establish a bank of quality cultures from donors exhibiting the familial form of Alzheimer disease. A critical part of this endeavor will be to provide investigators with complete data about the medical history and characterization for each culture provided. Program staff will try to attract new investigators into the aging research field through site visits and attendance at scientific meetings and through the conduct of conferences in the area of cellular aging.

Genetics Program

The primary goals of the Genetics Program are to understand the relationship between gene expression and aging and to find genes that influence longevity and senescence. The Genetics Program includes research using a wide variety of organisms ranging from insects to human populations. Special emphasis is given to mammalian genetics research because mammalian organisms are less remote from man than lower organisms, and mammalian systems often offer evidence directly relevant to human genetic influences.

Developmental Activities and Achievements, FY 1985

Current priority areas for the Genetics Program include identification and characterization of "longevity" genes, control of expression of genes related to aging, modification and rearrangements of DNA that accompany aging, and development of genetic theories of aging.

The development of the powerful tools of molecular genetics and their use to elucidate the structure of genes and the regulation of their expression holds promise for the Genetics Program. It is reasonable to expect that "aging" genes or DNA fragements containing these genes can be identified and isolated using these techniques, as has been accomplished for the gene for Huntington's disease. Such genes include both specific genes that affect longevity and genes that are defective in persons with various progeroid syndromes. To help evaluate the various research opportunities that exist and to provide advice to program staff on program development in this area, a Molecular Biology and Genetics Advisory Panel was established and had its first meeting in September 1985.

Another promising prospect is a congressionally mandated set-aside of $1.4 million in FY 1985 to support research on the molecular genetics of aging and the oldest old. The program has taken advantage of this opportunity in FY 1985 by funding two projects, one on the isolation and characterization of mutants of C. elegans with extended life spans, and the other on genetic control of cell division.

Program staff has continued negotiations with both DRR and NIGMS to co-fund the Caenorhabditis Genetic Stock Center (CGC). Both have committed funds for this center and have indicated a willingness to continue co-funding for several more years. Continued funding by all three Institutes is contingent upon development of a plan for charging user fees in the future. Program staff has begun discussions with the director of the CGC about instituting such fees. Staff also attended a meeting in May 1985 at Cold Spring Harbor Laboratory to discuss this issue with the C. elegans scientific community.

Research Highlights, FY 1985

- Of considerable interest to all of the programs in MCBB is the question of what controls replication and cell proliferation. The mechanisms of this control are undoubtedly complex, but considerable progess is being made along several avenues. One of these is being pursued by Dr. Arthur Kornberg in his research on the mechanism of initiation of replication at the origin of the E.coli chromosome. E.coli is an important model for this kind of research because of the large number of mutants available that are defective in replication. Dr. Kornberg has been able to separate initiation into three stages: pre-priming, supercoiling, and priming. He has identified many of the proteins involved in the pre-priming stage and has focused particularly on the role of the dnaA protein, which is uniquely required for priming at the origin, but not for priming discontinuous synthesis during replication. These studies will provide a fairly detailed picture of the mechanism of initiation of replication in this simple system. It is hoped the results will provide a solid basis for studying initiation of replication in mammalian cells, a process that is undoubtedly linked to the aging process in senescent cells (P01 AG02908).

- Caenorhabditis elegans is a model with considerable potential for use in studying the biochemical and genetic basis of aging. It has a short life span, is becoming genetically well marked, and is easy to culture. Richard Russell and Lewis Jacobson have been establishing biochemical and metabolic parameters related to energy generation and utilization, in hopes of using these parameters to measure the "rate of aging." These parameters include the level of lysosomal hydrolases, e.g., B-glucosidase, the composition of the isoforms of various enzymes, the adenylate energy charge, and lipofuscin content. Drs. Russell and Jacobson are now beginning to test the effects of nutritional restriction, growth temperature, pharmacological agents, and mutations on the rate of aging of this nematode (R01 AG01154 and R01 AG02655).

- A possible approach to studying cellular aging is to determine why cells die during development. Peter Bryant and Allen Shearn are using Drosophila mutants to attempt to understand the genetic control of cell death during development. For example, Dr. Bryant has studied the complex genetic locus dpp, where different mutant alleles produce different pattern abnormalities. His ultrastructural studies indicate that cell death in the imaginal discs of one dpp mutant occurs by cell condensation and subsequent lysis or phagocytosis by adjacent healthy cells during day 4. This phagocytosis is complete within 24 hours. He has also studied the apt locus, where mutants show extensive localized cell death in the wing disc of late third-instar larvae. In 5-day wing discs, portions of the cells are digested by selective sequestration and digestion of cytoplasm by lysosomal enzymes. Based on cumulative results with these and other mutants, Dr. Bryant proposes that cell death results from subnormal expression of various genes, that quantitative reductions in the levels of these gene products lead to partial cell death in the disc, and that the adult phenotype depends on the number of viable cells remaining in the disc (R01 AG01979).

- Dr. Shearn has isolated *ts* mutants that either fail to develop imaginal discs or develop abnormal discs at high temperature. He has followed embryogenesis in affected embryos and can determine at what developmental stage the temperature shift causes abnormal development and whether the effects are reversible. The use of these *ts* mutants has confirmed the hypothesis that many of the gene products that are essential for embryogenesis are also essential for imaginal disc development. They have also made it possible to manipulate development in ways not possible by surgical experiments. One *ts* mutant (RW630 at the c21 locus) has been analysed by 2-D gels; the mutation affects the rate of production of 5 different polypeptides. Dr. Shearn's current hypothesis is that the product of this gene is involved in post-translational modification. This mutation also causes development to stop without causing cell death (R01 AG01822).

- The myosin heavy chain (MHC) is an example of a protein whose sequence is developmentally regulated. Dr. Richard Strohman has shown that the MHC synthesized in the chicken embryo breast muscle is replaced by a neonatal form after birth and then by an adult form. The mRNA extracted from embryonic and adult tissue synthesizes only the appropriate MHC protein, showing that a different mRNA exists for each isoform. This result indicates that age-related isoforms do not result merely from post-translational modification, but probably from transcriptional control. When a muscle is injured by cold, it switches to the synthesis of embryonic MHC, but within two weeks after injury the adult form is once again synthesized. Dr. Strohman has prepared cDNA probes from mRNA for embryonic and adult MCH isoforms, and has begun to use these to probe the control of MCH gene expression during maturation and aging (R01 AG02832).

Overview of Program Plans, FY 1986-1989

During FY 1986 the program will continue to foster the use of genetic tools to investigate the control of basic cellular and molecular processes. The development of techniques to transfer identified control genes from one organism to another will provide opportunities to study control mechanisms and to test major genetic theories of aging. Combining the use of molecular techniques with more classical manipulations should dramatically increase the value of classical materials. Major program emphasis will also be placed on the continued development of a strong mammalian genetics research effort and on the recruitment of "modern" molecular geneticists to aging research. Emphasis will continue to be placed on the development of genetic biomarkers of aging. These biomarkers can then be used in related studies to test the various theories of aging in a systematic way as described below under the Molecular Biology Program.

FY 1987-1989. The Genetics Program plans to develop an initiative with the Geriatrics Branch to study the relationship between aging and cancer. Staff has proposed to hold a workshop and publish an RFA in FY 1987 for this purpose.

Other initiatives during FY 1987-1989 will depend in large part on the outcome of the genetics conference and evaluation activities that are planned for FY 1986. However, it is reasonable to assume that the rapid development of gene cloning and other genetic manipulations will lead to opportunities to test the details of current genetic theories of aging, together with possible new theories susceptible to empirical test. Biomarker development should have proceeded to the point where experimental validation of specific biomarkers can begin, along with explorations of generalizing animal biomarkers to human situations. Finally, it is possible that the identification of specific genes involved in age-related diseases (e.g., Alzheimer disease) may have progressed sufficiently to warrant the development of specific efforts to understand the mechanisms by which each gene acts.

Molecular Biology Program

The major objective of this program is to understand the biochemical and molecular events that lead from gene action to phenotypic expression. Program activities involve the investigation of the gradual or programmed alterations of structure and function that characterize normal aging and the investigation of the abnormal changes that characterize age-related disease states at the molecular level. Particular emphasis is being placed on empirical tests of molecular theories of aging.

Developmental Activities and Achievements, FY 1985

The establishment of a Molecular Biology and Genetics Advisory Panel to seek the advice of leading molecular biologists about the areas of greatest opportunity for research on molecular mechanisms of aging has already been noted above. Current priority areas for the Molecular Biology Program include mechanisms of free radical damage to macromolecules, mechanisms of DNA repair, characterization and metabolism of altered proteins, structure and metabolism of components of the extracellular matrix, and biochemical studies of molecular biomarkers of aging.

The workshop on "Molecular Biology of Aging" sponored by NIA in September 1984 has led to a program announcement on the "Molecular Biological and Genetic Basis of Aging," which appeared in the March 29, 1985, issue of the NIH Guide to Grants and Contracts. It is anticipated that this announcement will be seen by molecular biologists with a wide variety of research interests and that a significant fraction of these investigators will submit proposals that will be of interest to the Genetics and Molecular Biology Programs of NIA.

Research Highlights, FY 1985

- A long-standing priority area has been the relationship between aging and DNA repair capacity. In spite of many promising ideas and preliminary results, an unequivocal linkage between aging and DNA repair has not been established. One difficulty is that many of these studies have used unscheduled DNA synthesis as a measure of DNA repair capacity. This assay is fairly nonspecific. What is clearly needed is the use of more specific assays. Dr. Philip Hanawalt has discovered that the ability to repair DNA in mammalian cells is dependent on the type of lesion, its location in the chromosome, and its functional state. For example, he has found that 70-80% of pyrimidine dimers are excised from the gene for dihydrofolate reductase in the 24 hours following irradiation, whereas only 15% are excised from bulk DNA. These experiments were made possible by the use of recombinant DNA technology, and further progress can be expected as this technique is applied to other genes and regions of DNA. Dr. Hanawalt's objectives are to relate his findings to developmental and aging changes (R01 AG02006).

- The process of cellular aging in higher vertebrates is almost invariably accompanied by massive proliferation of intermediate filaments. The molecular basis for this process is poorly understood. Dr. Elias Lazarides has demonstrated that avian erythrocytes provide an ideal system in which this process can be dissected biochemically and immunologically during maturation and aging of the cell. He has shown that the filaments are composed of two polypeptides--vimentin as their core subunit and the high molecular weight protein synemin. The synemin subunits are spaced periodically along the core and create interfilament crosslinks to form a three-dimensional network that links the nucleus to the plasma membrane. Dr. Lazarides has prepared cDNA clones for vimentin and synemin and is now able to study the regulation of expression of these two genes during development (R01 AG04156).

- The structure of proteins and how that structure affects the metabolism of the protein are priorities areas in the Molecular Biology Program. George Rose has developed an algorithm that discovers every compact unit of any size in a protein of known structure. Five basic classes of structure (a-helix, B-sheet, turns, surface loops, and S-turns) can account for 89% of the total residues in the proteins under study. With this knowledge he can now investigate the conformation changes that result when specific amino acid changes occur (K04 AG00088).

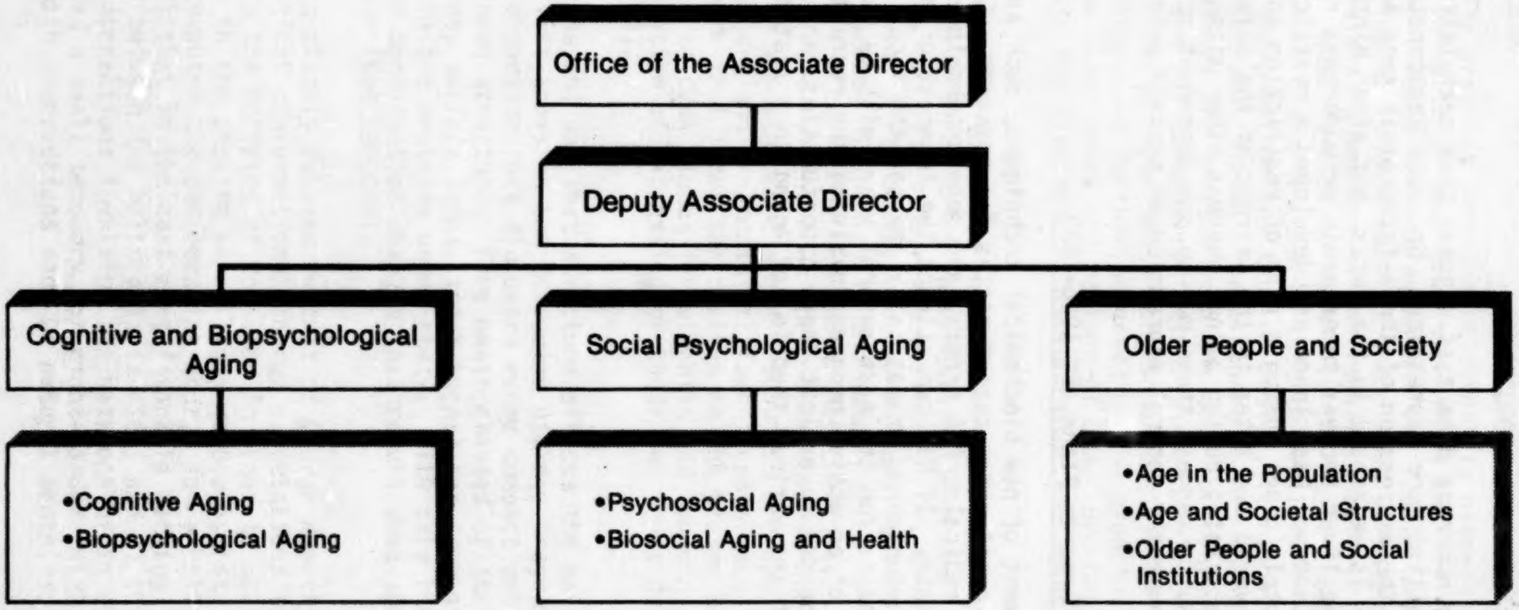
- The work of Dr. Rose is closely related to that of George Nemethy. Dr. Nemethy applies theoretical conformational energy calculations to collagen and peptides and models the behavior of collagen in order to study the role played by conformation in the packing of collagen molecules into fibrils. Specifically, he has computed the conformation energy for a-helices and B-sheets, concluding 1) that in the next most favorable packing arrangement, the angle between the helix axes is -36%, and 2) that intrachain nonbonded interactions involving the backbone of an extended polypeptide chain causes a small tendency for right-handed twist. Both of these findings agree with observations made on natural proteins, indicating that the models may be useful in predicting changes due to amino acid substitutions (R01 AG00322).

o There are numerous data that suggest that methylation of DNA plays a role in controlling gene expression. Dr. John Papaconstantinou has been studying the expression of the a-fetoprotein gene in the liver of mice. This gene is expressed in the fetus, but after birth expression ceases unless the liver becomes tumorigenic or undergoes regeneration. Dr. Papaconstantinou has cloned and developed a restriction map for the a-fetoprotein gene. Using a pair of restriction enzymes (HpaII/MSP I) he has discovered two sites in the introns of the a-fetaprotein gene that become methylated during aging, whereas other sites are always methylated. These results suggest there may be age-dependent methylations that occur and subsequently control expression of certain genes (R01 AG02172).

Overview of Program Plans, FY 1986-1989

The development of new biochemical techniques, such as recombinant DNA methods, is opening new opportunities for research. Classic theories of aging (e.g., free radicals, DNA errors, and gene programing) are now susceptible to empirical tests. If NIA can attract the interest of molecular biologists, it has the opportunity to dramatically sharpen the focus of basic aging research. Program emphasis for the next several years will be two-fold: 1) the development of an active program involving the recruitment and training of scientists needed to exploit these opportunities, and 2) the development of a plan to test the various theories of aging in a systematic way.

Behavioral Sciences Research Program


Office of the Associate Director
Deputy Associate Director
Cognitive and Biopsychological Aging
Social Psychological Aging
Older People and Society
•Cognitive Aging
•Biopsychological Aging
•Psychosocial Aging
•Biosocial Aging and Health
•Age in the Population
•Age and Societal Structures
•Older People and Social Institutions

5/18/84

BEHAVIORAL SCIENCES RESEARCH (BSR) PROGRAM

Within the tripartite biomedical/social/behavioral legislative mandate of the Institute, the Behavioral Sciences Research program is concerned with research and training on those social and behavioral factors that affect both the process of growing old and the place of older people in society. Established as a separate program late in FY 1979, BSR's official functions and authority include two components: (1) planning, directing, and setting policies for the BSR grant program; and (2) providing leadership for the broad scientific development of aging research by working with the relevant diverse programs of other agencies both in the United States and abroad. The program draws upon many social and behavioral science disciplines and requires convergence with the biomedical sciences as well. The long-range goal is to strengthen the social scientific basis for professional practice and public policy that can enhance the health and well-being of older people and minimize the personal and social costs of health care and dependency.

Selected Program Activities in FY 1985 and Plans for FY 1986

The BSR program has continued to make progress both in strengthening the grant program and in furthering the science on many fronts. As the various social and behavioral science communities have been alerted to the centrality of aging as a concern of their disciplines, the base has been laid for NIA to move strongly ahead.

The Grant Program, FY 1985 and FY 1986

The consistent growth in the numbers of funded research and training grants, together with the increasing excellence of the applications, signify staff accomplishments in strengthening the program as a whole while defining specific initiatives for current attention. The blueprint for the broad program lies in the continuing program announcement on "Social and Behavioral Research" at NIA, with the cross-cutting theme of "Maintaining Health and Effective Functioning in the Middle and Later Years" in the second broad announcement. These announcements stress BSR's main goals of understanding both (a) the social and psychological components of the aging process and (b) the place of older people in the changing society and its institutional structures, thus laying the knowledge base for enhancing health and functioning and slowing the processes of aging.

As the early announcements have led to more specific initiatives and announcements, BSR research is continually demonstrating the general principles which, since they challenge many stubbornly defended stereotypes, bear repeating: (1) Aging is a life-course process (old age cannot be understood without reference to the groundwork laid throughout adulthood); (2) Aging is a psychosocial as well as a biological process (people do not grow older in laboratories); (3) Aging is not universally and permanently fixed, but changes with changes and variations in the society; and (4) Because aging is not entirely immutable, it is subject to a degree of human intervention and control. Many of the research findings reported in 1985, as they uncover patterns in the mosaic of understanding, are gradually specifying these principles. To illustrate at the outset just a few of these emerging themes, numerous cognitive studies, going beyond the traditional information-processing paradigms, are observing the impact on memory or on visual perception of the real-life contexts of daily living. The relevance of accumulated experience to judgment, decision-making, or ability to cope is becoming recognized. Behavioral geriatrics research is pointing to the significance of health-promoting behaviors, social ties, and subjective psychological factors for morbidity and mortality among older people. Interventions through training or through modification of environmental settings appear successful in reducing a variety of age-related decrements. Current trends are producing a problem of potential severity in the mismatch between large numbers of relatively healthy and long-lived retirees and the paucity of social opportunities open to them. This mismatch often begins well before retirement as work situations fail to challenge and reward older workers. Several BSR initiatives address these emerging themes.

Special Initiatives

Within BSR's broad blueprint, and stemming from earlier scientific development activities in BSR, several special initiatives have been designated for attention, some in 1985 and 1986, some in the planning stage for 1987. All include research training as well as research. Many activities involve collaboration with BRCM or other programs in the Institute. Though rarely limited to a single BSR cluster, each has a primary location under a specific BSR project officer. Since most but not all relate to an Institute-wide initiative, they are spelled out in considerable detail as follows:

- Cognitive Aging: Studies are specifying the mechanisms of age-related changes in intelligence, learning ability, memory, and sensorimotor functioning. The program announcement on "Visual Perception and Aging" is yielding a body of applications and is to be followed by a parallel announcement on "Hearing." New dimensions of functioning that can be examined across the entire life span are being sought, following the conferences jointly sponsored by BSR and the Max Planck Institute. Research is moving outside the laboratory to examine real-life contexts, and interventions are being tested to determine whether they can produce improvements in older people.

- Biopsychology of Aging (1987): Biopsychology studies the relationships between behavioral aging and the neural and other physiological aspects of aging, e.g., the genetic bases of behavior, animal models of behavioral aging, biofeedback, and the neuropsychology of aging together with the behavioral components of neuroendocrinological and neuroimmunological aging. It is central to the promotion of health and effective functioning, as well as to a general understanding of psychological aging.

- Behavioral Geriatrics Research: This area of study is furthering knowledge of how health-related attitudes and behaviors of older people and their families and friends are acquired, affected by daily living, change as people grow older, and can be modified as both health-promoting and health-impairing behaviors are identified. Findings relate to how older individuals monitor their own bodily functioning, how they define and interpret symptoms perceived as abnormal, and whether they take or fail to take remedial action. The Special Emphasis Research Career Award (SERCA) in behavioral geriatrics research is gradually providing opportunities for a few established social science investigators to seek training and experience in biomedical research.

- Effects of Gender on Health and Longevity: Many studies document, but few attempt to explain, the paradox that women report more illness and health care utilization than men, yet today life expectancy is consistently higher at every age for women than for men. This difference in life expectancy is not invariant, but has been increasing rapidly throughout the century. These changes, especially as they relate to ethnic and cultural backgrounds, create a special opportunity for research on the sources of gender differences in health and longevity and on the implications for the quality of life of older people of both sexes, their ability to function independently, and the societal costs entailed.

- The Oldest Old: This initiative focuses on the remarkable and unexpected increases in longevity at the later ages. Following the 1985 program announcement on this topic, research here includes studies of morbidity, mortality, and causes of death and also seeks answers to such questions as: What will the very old of the future be like--in health, functioning, values, and attitudes? What changes will be made in social structures to accommodate their needs and utilize their potential contributions? Several related activities are in process or being planned for 1987.

- Changing Age Composition of the Population (1987): This initiative will be concerned with modeling the societal impact of the changing age composition of the population on the health and status of older people, including an examination of migration patterns. While the exact form of the initiative and the relation to the macroeconomic-demographic model developed by the Institute's Epidemiology, Demography, and Biometry (EDB) Program remains to be specified, BSR does not contemplate funding a large all-encompassing model. Rather a series of methodological advances and small scale simulations is planned, emphasizing heuristic aspects (the evaluation of current methods, the development of improved methods, and the identification of gaps in the data base and research), rather than the production of forecasts.

- Economic Well-Being of the Elderly (1987): Assessing the economic well-being of older people is fraught with difficulties, such as accurate estimation of the impact of taxation, monetary and nonmonetary public benefits received, the flow of cross-generational transfers, sources of income, and the real consequences of asset liquidity for the health of older people. Failure to address these problems may result in inappropriate targeting of resources away from the most economically disadvantaged and thereby impair the health of the most needy among the this age group.

- Influences of Social Institutions on Health and Functioning: The 1984 program announcement in this area is stimulating studies in the identification of conditions and strategies in work organizations, families, and health care systems that can prevent, reverse, or alleviate many old age disabilities. Emphasis in 1986-1987 will be placed on how particular aspects of formal health care systems and patient-provider interactions relate to health and functioning of older people. Another planned offshoot for 1987 will be a special initiative on "Family and Living Arrangements Among Older People," concerned with how the transformed kinship system will operate; how it will affect intergenerational relationships and influence the family's capabilities as the major system for emotional support and care of older people; how it will reinforce or change the norms of independent housing and shape new roles for women; and ultimately how it will alter the ways in which people age.

In addition to these cluster-focused initiatives (described in detail in subsequent chapters), three others are located in the Office of the Associate Director (OAD) as a means of BSR-wide coordination or guidance during early phases of development. OAD-focused initiatives for FY 1985 and FY 1986 are:

- Research Methods and Data Resources: Continued efforts are being made to stimulate development and application of social science research methods to research on aging, and to identify and support human study populations and data archives for use by NIA investigators. Beginning in FY 1985 and continuing into FY 1986, a series of workshops is being held jointly with the National Institute of Mental Health (NIMH) on methods of longitudinal and cohort analysis. BSR is arranging didactic sessions for the 1986 meetings of the American Sociological Association that will produce materials for future NIA use on methods for analyzing continuous life histories; on linking social change to the aging of individuals; on improved measurement; on cross-national comparisons; and on causal analyses of interrelated medical, behavioral, biological, and social variables. In order to improve the quality and availability of large-scale databases for use by extramural and intramural investigators, BSR contributes to the support of the National Archive for Computerized Data on Aging (NACDA), the Panel Study of Income Dynamics (PSID), and various materials from the Bureau of the Census and the National Center for Health Statistics (NCHS). It is considering contributions through NCHS to the Survey of Income and Program Participation (SIPP). In addition to this general methodological development, efforts are being made to improve techniques in specific research areas such as the changing age composition of the population (as discussed on the previous page).

- Health, Behavior, and Aging: A major BSR initiative that relates to promotion of health and functioning of older people but far transcends the work of NIA is one on "Health and Behavior." BSR takes leadership in the NIH Working Group on Health and Behavior and, during 1985, continued to spearhead the proposed Public Health Service initiative on "Health and Behavior" that encourages interagency as well as interdisciplinary cooperation. In a 1985 meeting of the American Sociological Association, the Directors of the NIA, National Institute of Child Health and Human Development (NICHD), and NIMH came together to discuss this topic. EDB staff also serves on the Institute of Medicine (IOM) Planning Committee for a project on "Health Promotion, Disease Prevention for the Second Fifty." A BSR staff member takes responsibility for organizing the NIH seminars on health and behavior, and, along with other staff, promotes this initiative on many fronts.

o Productivity in the Middle and Later Years: This initiative implements that portion of the National Plan for Research on Aging* concerned with conditions and strategies for optimizing human performance throughout adulthood. As a focus for integrating strands of program development emerging throughout the BSR program, small planning groups and commissioned papers will be arranged during 1986 to deal with selected aspects of the topic. Many explanations have been adduced for the declining labor force participation and frequently reduced productivity of older workers, but few facts are available. Research is clearly needed on the relationships among age, work incentives, health, and productivity; the role of motivation in performance; the connection between age-related cognitive and sensorimotor abilities and the skills needed in particular jobs; mechanisms for providing phased retirement and flexible work schedules; and the precise nature of the relationship between self-reported health and early retirement. Outside the paid work situation, human factors approaches can be useful in determining capabilities of older people for engaging in various productive behaviors and for maintaining independent living outside of institutions.

Broad Scientific Development, FY 1985 and FY 1986

BSR's concerns go beyond grants to the provision of scientific leadership in this new field. Thus the Office of the Associate Director, with the support of other BSR staff, is engaged in four sets of activities which are essential to, but transcend in scope, BSR's grant program:

o Defining areas needing research and training: Each of BSR's initiatives has a scientific history in BSR. For example, as a consequence of a series of conferences with the Max Planck Institute, the initiative on "Cognitive Aging" is now broadened to search for possible not-yet-measured dimensions of functioning that may improve with age and experience.

o Coordination with other programs here and abroad: BSR maintains working relationships with many national and international organizations, both public and private, including other Institutes at NIH and the Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), the National Center for Health Services Research (NCHSR), the Bureau of the Census, the IOM, the National Academy of Sciences (NAS), the Committee on Life-Course Development of the Social Science Research Council, the Commission on College Retirement, the Carnegie Corporation Aging Society Project, the American Council of Life Insurance, the World Health Organization (WHO), the International Institute of Applied Systems Analysis, and many others. Within NIA, BSR coordinates regularly with other programs and has worked intensively with NIA's Biomedical Research and Clinical Medicine Program (BRCM) on such projects as an interagency agreement to study "Falls in the Elderly," clinical trials for treatment of "Systolic Hypertension in the Elderly Population (SHEP)," "Teaching Nursing Home (TNH)" research awards, "Alzheimer Disease Research Center (ADRC)" awards, and cooperative agreements to study "Urinary Incontinence."

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*NIH Publication No. 82-2453, September 1982.

o Equal Employment Opportunity activities: BSR makes every effort to stimulate and encourage work by minority scientists, as in the staff visits this year to Howard University and Meharry Medical College, to the Puerto Rico conference of all the island institutions of higher education, and through liaison to the NIH Minority Access to Research Careers (MARC) Program.

o Integration and dissemination of knowledge: As the widely scattered research on aging gradually evolves into a cumulative body of knowledge, it must be carefully assessed, integrated, and communicated. Toward this end, BSR continues to stimulate conceptual and methodological papers, transfer of practical information (e.g., the WHO report on Self/Health/Care); reports of BSR-sponsored conferences and committees [e.g., the joint National Institute of Alcohol Abuse and Alcoholism (NIAAA)/NIA/NIMH report on alcohol problems among the elderly and the Social Science Research Council volume on interdisciplinary perspectives in human development], and preparation and publication of bibliographies and state-of-the-art symposia (e.g., the special issue on "The Oldest Old;" a Handbook article on "Age Strata in Social Systems;" and a forthcoming volume on aging in the Academy of Behavioral Medicine Research series).

Older People and Society (OPS)

Research in this cluster is focused on the social and environmental conditions influencing the health, well-being, and functioning of people in their middle and later years. It is now widely recognized that socioenvironmental conditions in every country of the world markedly affect later-life mortality, the burden of illness, socioeconomic status, needs and attitudes, and the opportunity to maintain effective functioning and lead productive lives. Yet these conditions require much fuller specification if their influence is to be understood and appropriate interventions attempted. Moreover, the existing findings, often limited to a single environmental context, require replication in other places and at other times. Thus the three sections in OPS are concerned with research on the influence of age as a structural feature of society in (a) the population, (b) the organization of social roles, and (c) the smaller groups and institutions to which older people belong.

Developmental Activities and Achievements, FY 1985

Age in the Population (AIP)

This section supports research and training on the changing social and demographic structure of society as a whole. It consits of a wide range of demographic and epidemiological research (including cross-national comparisons) on such topics as morbidity, mortality, and causes of death; patterns of migration and rural-urban residence; age composition of the population; and distribution of the older population by sex, race, ethnicity, social class, etc.

The Grant Program

Several specific themes are emerging from the current grants in this section:

Studies are pointing to the increasing differentiation of the older population and are beginning to describe the rapidly changing nature of the oldest old age cohort.

Reinforcing previous reports of rapid mortality declines at the older ages and the accelerating rise in the numbers of the oldest old, increased research is being focused on the very old. Current research throws more light on the controversial assertion that growing numbers of deaths are being concentrated in the very late years. Also becoming the focus of increased research is the related question of whether, as mortality declines at the older ages, the prevalence of those burdened with chronic illness or disability, and thus needing special care, will decline, remain unchanged, or increase. More research is also being focused on the analysis of patterns in the causes of death and on cross-national studies of causes of death. Research on competing risks is assuming greater salience, especially in regard to whether they are dependent or independent.

Several studies on the so-called "cross-over" phenomenon in mortality rates have been made possible by advances in the technical procedures for estimating the accuracy with which the ages in mortality statistics are reported. Mortality "cross-over" refers to the reported phenomenon that the mortality rates of certain racial and ethnic groups, with initially high mortality rates in comparison with the native white population, tend to decline below that of the white population at some point in late adulthood. The current debate revolves around whether the observed "cross-overs" result from selectivity or poor data. The resolution of this question has important implications for the concept of hetereogeneity (differential frailty in terms of selection) and the biology of aging in general.

Retirement migration has also received close attention. New research has indicated the importance of several historic trends, now ongoing for three decades. Moreover, analyses of the stream of elderly return-migrants have uncovered the fact that return migrants are significantly poorer and less independent than general retirement migrants. Models of the migration process are beginning to be developed and tested, and important linkages are developing to other areas of the program including income, taxation, health services, and crime.

The Oldest Old. During the past year a major effort has been made in this section to identify areas for programmatic development and emphasis. As a result of staff analyses of major trends in ongoing research, supplemented by ad hoc consultants, a number of interrelated areas and approaches were singled out as important candidates for BSR grant initiatives or for scientific development more generally. In addition, results reported by a number of grantees have highlighted the changes in the mortality rates among the oldest old and the associated historic change in the age structure of this country.

A number of singularly important avenues for research follow from these observations. Most obviously on a very simple descriptive level, they show that our basic knowledge about those aged 85 and over is sparse and unreliable. Probably less is known about this age group than about any other--despite the fact that by one estimate the Federal Government spends over $50 billion on those over age 80. As the age structure changes, it is becoming increasingly important to be able to plan for the future needs of the very old and the demands that they will place on society for care and resources. While much of the immediately predictable growth in the size of the elderly population is attributable to changes in the size of birth cohorts (the "baby boom" cohorts), decreased mortality at the older ages is playing a larger role in the growth of this historically unique population--unique in that this is the first time in history that such numbers of the extreme aged have existed.

Because of the singular historical nature of the growth in the size of the oldest old population, understanding the cross-national variability in patterns of morbidity and cause-specific mortality is increasingly important to the further understanding of people's lives at the older ages. An allied need is improved methodology for projection and forecasting. A good deal of the program and scientific development in this section has centered around these issues, while the impact of these far reaching changes on society is the focus for much of the Age in Societal Structures (AIS) Section.

Although important advances are being made in the development of mathematical models of morbidity and mortality, adequate data to test hypotheses often present major stumbling blocks. While data from the National Health and Nutrition Examination Survey (NHANES) and the NIA Established Populations for Epidemiologic Studies of the Elderly (EPESE) are some years away from the general rsearch commuity, major new opportunities to test important hypotheses will be offered by the National Longitudinal Mortality Survey (NLMS); the followback of the 1984 National Health Index Survey (NHIS) Aging Supplement, to be coupled with mortality experience in the National Death Index (NDI) and linked with medical records; and the survey of Income and Program Participation (if the age 75 and over sample is augmented) with its linkage to the NLMS. Indeed, when these data sets become available, they will generate considerable research.

Following the recommendtions of the 1983 Ad Hoc Advisory Panel on the Oldest Old and the Ad Hoc Advisory Group on the BSR Program, a program announcement on "The Oldest Old" was released in late 1984. The announcement, while focusing heavily on concerns of this section, also covered topics of relevance to other sections in OPS and BSR, as well as the Geriatrics Branch of BRCM. This program announcement envisioned considerable focus in the early stages descriptive studies coupled with methodological innovations to improve the data quality for this population. As the descriptive database improves, more focused hypothesis-testing studies are expected.

Preliminary results from initial research on the over 85 age group were presented by BSR staff, grantees, and associates to the American Association for the Advancement of Science (AAAS) as well as at the Gerontological Society's annual meeting. Several of the papers from the AAAS meeting, supplemented by invited contributions, were edited by BSR staff for a special issue of the Milbank Memorial Fund Quarterly on the Oldest Old (June 1985).

In addition, BSR is taking the lead in organizing NIA's efforts to develop this topic, convening when necessary staff from the other extramural and intramural programs of the Institute.

Migration. As noted earlier, migration has also emerged as a topic that is ready for a more focused formulation. OPS has supported several research projects on the migration patterns of older people, and a fair amount is known at a descriptive level. On the one hand, it seems that at a descriptive level much of what needed to be done has been done, and all that remains is to update migration patterns at every Decennial Census. On the other hand, the development of more powerful mathematical models, such as the multistate-multiregional model, offers new optimism for integrating and explaining the patterns of migration in more powerful and generalized ways. Little is known about the economic and social impact of older migrants, either on the region from which they migrate or on the area into which they migrate. Moreover, there is need for tracking incipient changes in internal and international migration that affect older people. Through consultation with researchers in the field, a start has been made in redefining the OPS research effort on migration.

Scientific Development

Section staff has engaged in a number of coordinated activities designed to advance research on AIP generally and on the oldest old in particular along a number of interrelated fronts. Included in the overall strategy are such activities as encouraging methodological advances in projection and forecasting methodology; improving the methodology and the power of cross-national approaches and encouraging development of projects utilizing this approach; uncovering such barriers to research on the oldest old as the lack of adequate data bases and implementing solutions to the data inadequacy; planning scientific meetings on the topic; and preparing scientific review papers.

Forecasting. As one initial step, a paper was commissioned to review the strengths and weaknesses of the models that forecast and project both life expectancy and active life expectancy. The paper also inventoried the many different forecasting models in use within the Federal Government. This paper, together with a planning session, was used as the basis for organizing the June 1985 workshop on "Forecasting Life Expectancy and Functional

Ability," held in collaboration with the American Council on Life Insurance and the Health Insurance Association of America. Major proponents of the different methodologies were invited to the workshop. An important objective was to stimulate research on the methodology of forecasting life expectancy and related outcomes. A volume on forecasting health is planned, and the issue of forecasting will be given high priority in the program.

Cross-National Research. The international comparative approach is seen as an especially useful technique with which to study potential future trends in life expectancy and functional life expectancy by analyzing the national variability in patterns of morbidity and cause-specific mortality. A review paper has been commissioned on comparative international methodologies with specific reference to methodologies assessing convergence and divergence. Contact was made with the Pan American Health Organization to encourage aging research across the Americas. At the international conference at the International Institute for Applied Systems Analysis (IIASA) in December 1983, a number of proposed cross national projects utilizing new methodologies were discussed with potential investigators. The IIASA Task Force on Aging Populations adopted a coordinated approach to the analysis of several topics associated with aging populations across a wide range of industrialized nations. An important cross-national comparative proposal on migration of the elderly, utilizing novel methodologies and banking heavily on international collaboration, has already been funded by BSR. Additionally, BSR is funding the development of an "International Database on Aging" at the Bureau of the Census. The availability of this database should remove a significant barrier to cross-national demographic research on older people.

Sessions on cross-national demographic and epidemiological perspectives on the very old were organized by BSR staff at the meeting of the International Association of Gerontology in New York. Scientists from Canada, the United Kingdom, Israel, Denmark and Italy participated in the sessions. The group held a special session to discuss research initiatives, and an edited volume of the papers is planned.

As mentioned above, staff research has disclosed that barriers to research on those aged 85 and older exist within this country. Most of the data on this age group is sparse, fragmented, and often unreliable. A start has been made in developing an annotated bibliography and inventory of data sets on the oldest old.

In a further effort to correct the serious inadequacy of data on the oldest old available to investigators, BSR and other NIA staff have held a number of discussions with the Bureau of the Census and NCHS. In collaboration with these agencies, a number of proposals have been developed to remedy this lack. An ad hoc advisory group on data on the 85+ was convened in the summer of 1984 to evaluate these proposals and to formulate long-range plans to improve the quality of the data on this age group through amending future surveys, utilizing existing but unpublished data, and evaluating the potential of techniques for pooling data across surveys. This advisory group shares overlapping membership with an NAS Panel on Statistics.

A number of other activities are in the discussion stage, including 1) conducting special runs on the American Housing Survey, 2) pooling adjacent years of Current Population Survey (CPS) data in order to provide reliable estimates of the rapidly changing and growing oldest old population between decennial censuses, 3) co-sponsoring a series of data-related workshops with the Census Bureau, 4) developing an annual data report on the elderly population, and 5) augmenting the very old subsample in the SIPP survey.

An interagency agreement with the NCHS will make available to researchers a special unified data base composed of items from the NHIS and Nursing Home Admissions Surveys dating back to at least 1969, with a structure that allows both for analyses by fine age breaks and for a synthetic cohort approach. Appropriate pooling of adjacent years will be used where the sample sizes of the very old or oldest old are too small to permit reliable estimates. In the discussion stage is a proposal to collaborate with the NCHS on the analysis of preliminary data from the 1984 Aging Supplement to the NHIS. Through an interagency agreement with NCHS, NIA is funding the Longitudinal Study on Aging, in which those over age 80 and half of those aged 70-79 will be reinterviewed. Additionally, all respondents who participate in the 1984 HIS Aging supplement will be followed up through the National Death Index. Attention is also being given to the research possibilities of the National Longitudinal Mortality Survey and the quality of vital statistics.

In the area of demography, a brief review of the program's portfolio was conducted, and a background paper on family demography was commissioned. These reviews should result in the designation of new areas for development.

An ad hoc group of consultants and grantees in migration research will be brought together with the objective of exposing the descriptive researchers and the mathematical modelers to each other and developing a more targeted agenda for research.

Age in Societal Structures (AIS)

This section supports research and training in the influence of societal structures on behaviors, attitudes, health, and statuses of older people. It includes studies of patterns of work and retirement; socioeconomic status; sources of social support and well-being; cross-cultural and cross-temporal variabilities; and the influence of sex, race and ethnicity, and social class on older people's roles. Age-based roles and social structures provide important opportunities (or constraints) for behaviors that can either lead to disease and disability or can promote health and positive physical functioning. A range of studies in this program seeks to understand--and perhaps to demonstrate--means of modifying those social, cultural, and environmental conditions that promote health and prevent the deficits of diseases and disabilities in the middle and later years.

The Grant Program

Projects in this section are concerned with various aspects of the age-related social structures and cultural norms that constrain and influence older people's lives and the roles occupied by older people.

Work and Retirement. Much of the current research in this section addresses the patterns of retirement, labor force participation, and associated health and economic well-being of older people. Despite unprecedented increases in longevity, labor force participation rates of older males have declined steadily since 1900 when two-thirds of older men worked. In 1980, only one-fifth of older men were in the labor force. As distinct from the longitudinal studies of retiring individuals supported in the Social Pyschological Aging (SPA) Cluster and focused on aging processes, OPS-supported studies on this topic are focused on the place of older people in society and its institutions. They are concerned with 1) the relationship of pensions, income, marital status, health, and other factors to retirement; 2) the patterns of early retirement; 3) the structural factors that may partially account for why older people have difficulty finding jobs; and 4) how old-age pensions differ across workers, industries, and nations and how these differences have changed in recent decades.

As previously reported, this area of research was the focus of a workshop on "Work and Retirement" in September 1983, where some 20 BSR-supported investigators met with BSR staff and made presentations of their own work and discussed issues needing further research. Priorities identified for research emphasis included the ability of older people to finance retirement, the implications of population aging for patterns of work and retirement, cross-national comparisons, basic work productivity of older persons, technological change and older workers, the meaning of work in people's lives, and the conditions under which people choose to continue working beyond retirement age. Several themes addressed by current research were discussed including cohort comparisons, gender comparisons, retirement as a process, societal mechanisms for socializing older people into their roles as retirees, the advantages and disadvantages of secondary vs. primary data analysis, and the need for large-scale surveys and new descriptive data to answer questions about work and retirement.

Findings in this area continued to build on the findings reported in FY 1984 on 1) the variation across industries and jobs in the propensity to hire and retain older workers and 2) the role of economic and health factors as determinants of retirement. For example, analyses of the sharp break in the propensity to retire at age 62 were reported in 1984. This year analyses of trends in benefit profiles between 1960 and 1980 uncovered the recent development of a sharp peak in benefits at age 62, with large reductions for those choosing to work beyond that age. One hypothesis to account for this development is that employers who are no longer able to force workers to retire manditorily make retirement a more attractive option.

In another important area, progress was made in utilizing certain structural features of the labor market (the economic theory of long-term contracts) to explain why older workers are not hired into some jobs even if qualified and productive.

Important findings came from a project designed to estimate the industrial demand for retirement-aged labor in the form of long-term employment and the design of social insurance programs for the disabled with imperfect screening. Findings that large firms systematically employ fewer older workers, have higher separation of older workers, and have policies discouraging employment of older workers were reported in FY 1984. Current analyses that integrate disability programs and disability screening into the model revealed the sensitivity of older male labor force participation to the rigor of the disability screen as well as to the level of benefits.

The confluence of results in this area suggests that to fully understand the labor force participation of older workers a coordinated multidisciplinary effort is needed with other clusters in BSR and BRCM to integrate several diverse components. Among the needed areas of investigation are studies of the labor market, studies of the impact of age discrimination legislation, epidemiological studies of the health and functioning of older workers, human performance studies assessing the relationships between productivity and the high level of cognitive and sensorimotor skills needed in certain jobs, biopsychological studies of the impact of chronic degenerative diseases on these skills, and studies of the appropriate rehabilitation or intervention to remedy disabilities. Except through inference, surprisingly little is now known about either the actual or perceived relationships among age, productivity, and salary.

Socioeconomic Status. Another important area of research in this section is the economic well-being of older people, especially as it influences their health, including differences by race, sex, and other characteristics. Diverse studies have shown how life course patterns of home ownership for whites and blacks differ, for example. As reported in FY 1984, a number of grantees have noted divergent trends in recent decades in the financial well-being of older individuals with their overall financial status improving and the percentage in poverty declining, but with some subgroups such as the very old showing far less economic improvement. A number of studies widely reported in the press found that the older population fared far better than the rest of the population, especially after taxes. However, these studies, considered to be averages rather than distributions, failed to adequately disaggregate the older population.

It seems as if this is an opportune moment to reassess the official definitions of poverty and near poverty for older people and also to assess the impact and consequences (especially on health) of financial hardship on this age group and especially the very old. Although the OPS cluster supports numerous studies on the economics of aging, specific areas have been targeted for high priority. Reviews of this topical area and the grant portfolio were commissioned from a number of economists and demographers, and it seems increasingly useful to bring in advisors early in FY 1986 to consult on the subject of the economic well-being of older people and to help set priorities for research in the area.

Cultural Variations in the Social Context of Social Support. A third important area of research in the Age in Societal Structures Section continues to be the larger social context of social support (which is studied at the individual level in SPA). Several studies consider cultural variations in social support, comparing American ethnic and racial groups as well as patterns in other cultures and countries such as Hong Kong and the Israeli kibbutz. Studies also compare social support patterns among men and women and consider support available to and used by the frail elderly. This year brought in findings on patterns of social support from a national survey of the black elderly and some preliminary findings from a study of patterns of support and health status among older Navajo.

Patterns of Care for Frail Elders. In addition, this section includes studies that are beginning to generate some preliminary findings about patterns of care and support for frail and vulnerable older people. A study conducted by an NIA grantee is producing higher prevalence rates of frailty and also higher response rates than expected. A pilot project on the care system in Israeli kibbutzim shows extensive collaboration between formal and informal systems. A larger study is expected to produce practical information about the viable limits of informal care.

Scientific Development

Staff has begun the task of assessing and developing the area of the economics of aging. Review papers were commissioned to 1) assess the current portfolio of holdings in the area, 2) suggest promising areas of development, and 3) suggest topics for a workshop. Partially as a result of these development activities, a number of large scale projects were submitted for review or are in the developmental stage. However, several important areas of research remain underrepresented, and the Institute's role in health economics needs to be specified in light of the activities of other agencies such as NCHSR and the Health Care Financing Administration (HCFA).

Looking to the future, the emergence of SIPP with its potential linkages to Social Security and Medicare, the PSID health panel, and the proposed National Medicare Expenditure Survey, will allow a wide range of important questions to be answered for the first time. These new data sources will lead to an influx of new investigators in this field.

Another emerging issue is that of the relationships among productivity, performance, and aging. This issue, fueled by recent court actions based on the Age Discrimination Acts, lacks an adequate scientific base. As a start, a paper was commissioned on "Productivity, Salary, and Aging."

Another issue on which staff in OPS are beginning to focus attention is that of intergenerational conflict. A consequence of the growing financial well-being of the general elderly population relative to the rest of the population and of the growing need for health care services for older people (especially for the very old) is that the potential for serious intergenerational conflict may be increasing. This possibility may be exacerbated by the growing demands to curb the costs of benefit and transfer programs for older people. A seminar was held at NIA on "Children and the Elderly: Diverging Paths for America's Dependents." Planning for activity in this area began in late FY 1985, and formal activities will begin in FY 1986. Where possible, activities will be coordinated with the National Institute of Child Health and Human Development (NICHD) and the Population Committee of the NAS.

Patterns of aging among various population subgroups remain an important focus within the Age in Societal Structures section. Staff has worked with an Institute-level committee to plan a workshop on Research on Aging Black Populations scheduled for September 1986.

Older People and Social Institutions (OPI)

This section supports research and training on (1) how, and with what consequences, people are influenced by the intricate network of social institutions in which they grow old: families, households, communities, work organizations, educational and religious institutions, political institutions, and health care and welfare institutions; and (2) how these institutions are being affected by increases in longevity and in the numbers of older people in society. Such research can contribute directly to understanding and possible modification of the conditions enhancing health and functioning in middle and later life.

The Grant Program

During the last five years, the principal social institutions receiving attention in this section have been the family, occupational institutions or work organizations, household and community environments, governmental institutions, and health care systems.

Several sets of grants, together with related program development activities, address the following areas:

As was the case in FY 1984, the majority of the grants in the OPI Section in FY 1985 were concerned with the family. The family is the older person's main source of affection, emotional support, and care, but it is also undergoing many changes; increasing longevity has revolutionized the structure of the family so that four, even five generations of a family are alive at the same time. Divorce and remarriage, growing labor force participation by women, and the decline in family size are affecting the family system. Studies in the OPI program are investigating the nature of family relationships in the middle and later years as well as changes in family patterns, including historical changes and more contemporary changes associated with divorce and remarriage, family relationships and health, and the care of older relatives by family members. During FY 1986, staff plans to commission a paper in this broad area from an established researcher as well as to convene an advisory panel to help plan program initiatives on aging and the family.

Although the BSR program as a whole supports a large number of studies on various aspects of work and retirement, only a few are currently concerned with these issues within individual work organizations. Staff is planning to convene an advisory group on "Aging and Work Environments" to assist in program development.

Despite the importance of the interaction of older people and formal health care systems, the number of projects in this area has remained small for the last three years. Recent research includes a study of the effects of nursing home staff attitudes on the functioning of patients; a study of organizational characteristics of nursing homes in relation to patient morbidity and mortality; a study of the effects of intra-institutional relocation on the health, physical functioning, and social and psychological adjustment of institutionalized older people; and an analysis of older patient-provider interaction as related to patient outcomes. A planning meeting was held in December for a larger workshop in September 1985 on "Social and Behavioral Aspects of Aging and Formal Health Care." NCHSR co-sponsored the workshop. Presentations were made by NIA and NCHSR grantees in four sessions with discussions by recognized experts in the field. During FY 1986 staff plans to edit a book that will draw on the work of grantees and others in this area. A program announcement is also planned.

OPI also supports studies under the heading "household and community." They are concerned with home ownership, physical aspects of housing, specialized living arrangements such as retirement communities, involuntary relocation, subjective meanings associated with home, and trends in and consequences of living alone. New projects using national data are examining determinants and consequences of particular living arrangements. A commissioned review paper and planning meeting are also planned on the topic of housing and living arrangements of older people.

As a guide to focus research in the OPI Section, a program announcement, "Social Environments Influencing Health and Effective Functioning in the Middle and Later Years," was developed and issued in November 1983. Research on social and environmental interventions is beginning to identify conditions and strategies for preventing, reversing, or alleviating many old age disabilities. For example, jobs can often be modified to improve intellectual functioning and physical, as well as mental, well-being of workers as they grow older; physical environments can be designed to minimize accidents, or special assistance from family and neighbors can be arranged to maintain independent functioning of many frail older people in their own homes. Even in nursing homes, regimens can be adjusted to restore activity, personal control, and well-being of older patients. This announcement, which is now beginning to generate applications, calls for research to specify how the social environments of older people at home, at work, and in the community can be adapted to optimize health and functioning.

Scientific Development

During FY 1985, staff time was largely devoted to consulting with individual applicants in OPI areas of responsibility in the grant program, to planning for and holding the workshop on "Aging and Formal Health Care" in September, and to conducting other BSR activities such as continuing to work with the BSR referral guidelines for the NIH Division of Research Grants Referral Handbook.

As mentioned above, review papers and planning meetings in the areas of family relations and aging and housing/living arrangements are planned for FY 1986. In relation to the section's studies of housing and living arrangements, OPI staff served on two government committees for data collection and analysis in this area: a Committee on the Institutional Population for the 1990 Census and an Interagency Work Group on Board and Care Classification.

Research Highlights, FY 1985

Age in the Population

Population Composition

o Evidence of the very rapid growth rate of the very old population is becoming available. The 85 and older age group, the most rapidly growing age group in the American population, increased possibly by 141 percent between the 1960 and 1980 censuses. This rate (141%) is nearly three times that of all persons 75 and over, and over five times that of the total population. In the previous 20 years, 1940-1960, the age 85 and over population grew just as rapidly (154%). Data from many underdeveloped countries also show the very rapid increase in the age 85 and over population (Rosenwaike, R01 AG03128).

While the elderly population is itself aging, the oldest old population is sharing a similar fate. Between 1970-1982 the number of persons 95 and over increased at about twice the rate of the aggregate population 85 years and over. The centenarian population, while accounting for only 1% of the total population over age 85, grew even more rapidly. Based on Medicare enrollment data, the population aged 95-99 doubled between 1970 and 1982, but the centenarian population quadrupled, advancing from about 7,000 to 32,000. Because of the poor quality of the data for those over age 85, there is probably a large margin of error surrounding these rates of growth. However, the accuracy of Census records on the extreme aged is improving. Comparisons of Census Bureau statistics on the extreme aged with death records and Medicare enrollment figures suggest that the error in the Census estimates of population has been small in recent years.

The character of the oldest old population is changing rapidly. Demographic analyses of the changing composition of the population aged 85 and over find a number of startling trends in the sex ratio, in the percentages of men and women who are married, in the sex and marital composition of the institutionalized population, and in living arrangements, country of origin, education, and income.

Between 1930 and 1980 the sex ratio of males to females declined from 75.4 to 43.7, and the decline shows no sign of moderating.

Between 1950 and 1980, as a result of the gains in female life expectancy, the proportion of married males in this age group increased from 33.6% in

1950 to 48.4% in 1980. While 48% of all men 85+ were currently married in 1980, only 1 in 12 of the women of this age group was married.

During the period between just 1970 and 1980 the percentage of women 85 years and over living in nursing homes and other long-term care facilities increased from 22% to 26%, while the percentage for males only increased from 14% to 16%. As is to be expected, the institutionalized population aged 85 years and over includes many more widowed, divorced and never-married males than the community population. Equal percentages of females in the community and in institutions are widowed, while substantially higher percentages of the institutionalized extreme-aged women had never married.

Between 1950 and 1980 the percentage of men 85 years and over in the community who lived in a household headed by a child or the child's spouse, dropped from 32% to only 9%, while the corresponding reduction for women was from 47% to 18%.

As a result of the reduced levels of immigration after World War I and the build-up of native cohorts of the oldest old, the composition of the oldest old has changed substantially. During the first quarter of this century the foreign born constituted as much as 30% of the 85+ population, but only 19% by 1980.

New cohorts of 85+ are increasingly better educated. Thus, in 1970, 23% had completed high school while in 1980 the percentage had increased to 30%. During the last decade the poverty rates among the oldest old declined but still remained relatively high. Although the poverty rate of the oldest old declined from about 37% in 1970 to 21% by 1980, this rate was still considerably higher than the 12% of those aged 65-69 who lived below the poverty level. However, further work is needed on the meaningfulness of the various definitions of poverty thresholds for older people.

Mortality

o Life tables in Puerto Rico probably overstate life expectancy. Recently published findings of an investigation of life expectancy among both males and females in Puerto Rico show that there is widespread overstatement of age at older ages. Such overstatement produces mortality rates that are too low and thus overstate life expectancy. As a result, current life tables need to be modified. This finding has important implications for analyses of the mortality cross-over phenomenon (Rosenwaike, R01 AG02808).

o The monograph Recent Trends in Mortality Analysis (Academic Press, 1984) includes many findings on population mortality patterns among the elderly and very elderly, reported as preliminary in prior year program reports. Many new findings are also reported on the geographic variability of cause-specific mortality patterns among various demographic groups defined by age, sex, and race (Manton, AG01159).

Mortality from ischemic heart disease and stroke continues to decline and is also accompanied by increases in the mean age of death from these causes. Prior analyses showed that the decline in mortality rates for these diseases for the period 1968-1977 extended into the period 1970-1980. However, due to the improved survival at older ages these declines were not accompanied by corresponding decreases in the lifetime probabilities of dying from those diseases.

Trends in cancer mortality rates presented a very different picture from that presented by trends in cardiovascular disease mortality rates. Between 1968 and 1980 cancer rates increased 10.5% for white males, 5.8% for white females, 19.9% for non-white males and 7.4% for non-white females. As in cardiovascular disease mortality, the mean age of death also increased some 2 to 3 years.

Of the major chronic disease killers, stroke exhibited the large decrease in underlying cause of mortality rates in the period 1960-1980, with an average decline of 41%. Analysis of the change in the stroke's role from that of an an underlying cause of death to an associated one suggests that the prevention of death due to a stroke would have increased an individual's life expectancy by 9 to 10 years in both 1968 and 1977. Further, these increases would persist into advanced ages where at age 75 the increase in residual life expectancy would be about 6 to 7 years.

Much of the rise in cancer mortality occurred as a result of increases in formerly low-risk nonmetropolitan areas. A preliminary analysis focusing on the considerable geographical variation in cancer mortality showed that increases in cancer mortality for the period 1960-1980 could be attributed primarily to increases in the lower risk nonmetropolitan counties, since the risks in the highest risk counties remained relatively constant.

Preliminary cohort analyses of lung cancer mortality find differences across cohorts on the order of 5 to 1 in relative risks. The distinct sex-linked patterns were also replicated across geographic areas. The increases in temporal mortality are partially due to younger cohorts with increased levels of risk factors (such as smoking) moving into the age range in which cancer operates.

Important advances were made in the development of a general stochastic model of aging, morbidity, and mortality for longitudinally followed community populations such as Framingham. The newly developed model answers a major criticism of standard demographic models of competing risks since the mortality risks are not required to be independent. Smoking can thus be treated as a risk factor for both cancer and heart disease in the same model.

New models were developed for the heterogeneity of mortality risks among older people. Analyses of mortality in the Medicare population at ages 65 to 95 on a cohort basis during the period 1960-1978 found that Gompertz or Weibull hazard rate functions failed to fit these data if the populations were assumed to be homogeneous. An assumption that frailty is fixed for individuals was tested in two forms of heterogeneity models (one assuming gamma distributed frailty, the other assuming inverse Gaussian distributed frailty). In a stochastic process model with observed and unobserved variables, this assumption was found to be satisfactory.

The heterogeneous population model was strengthened by results from a longitudinally followed population in Evans County, Georgia, that suggested that black-white mortality rates do "cross-over" and that this phenomenon is not simply an artifact of census enumeration errors or of age misreporting. The heterogeneity explanation, which argues that the cross-over results from the greater robustness of black survivors at older ages (due to the prior selection of less robust blacks at earlier ages at much higher rates than in the case of less robust whites) remains, however, controversial.

A newly developed model of the interrelationships of disability, morbidity, and mortality demonstrates the need to consider these interrelationships in planning federal programs. The model, designed to explain the increases in mean ages at death due to specific diseases, found important differences in the growth of nursing home utilization rates depending on whether or not disability rates were tied to mortality rates. While a static component projection indicated a growth rate of 2.2% per year for the period 1980-2040, the projected growth rate declined to 1.4% per year when the disability rates were tied to the mortality rates and declined in tandem.

Migration and Geographic Distribution

- o New analytical models are being used to understand the migration patterns of older people. Recently published results of major interstate migration flows of persons aged 55 and above suggest that the "gravity model" (population size at origin and destination and distance between states) explains an equal amount of the variation in retirement migration (25%) as the "ecological model" (cost of living, climate, tax rates, health services, and the crime rate) (Serow, R01 AG03798).

  Different factors explain out-migration and in-migration. Housing costs and higher crime rates are important "push" determinants of out-migration, while lower tax rates, greater supplies of health services and warmer climates operate as "pull" factors determining in-migration.

  A disturbing pattern of increasing age segregation has been found in a preliminary analysis of Houston. Between 1970-1980 in Houston, one of the nation's fastest growing metropolitan areas, those Census tracts with a disproportionately large share of older residents in 1970 experienced considerable aggregate aging. Tracts without this initial concentration of older individuals saw the proportion of older adults remain the same throughout the decade. Moreover, the older residents in the more highly age-segregated tracts experienced a higher rate of poverty than the residents of less segregated tracts. This suggests that within the older population a pattern of socioeconomic segregation is emerging.

- o Increasingly, when older people move, they move long distances. Although the older population is growing more residentially stable over time, those who now move tend to make substantial long distance moves, with interstate migrants increasing from 959,000 to 1.7 million between 1960 and 1980 (Longino, R01 AG03266).

Despite the 73% increase in interstate migration among older people, the older population is growing more residentially stable over time. The reason is that the increase in interstate migration was offset by a relative decline among persons moving locally within their county. Thus, overall the percentage of nonmovers grew 72% during this period.

Florida continues to dominate the retirement immigration picture. The role of California and New Jersey declined as recipients of elderly migrants while Arizona, Texas, and North Carolina ascended. Florida and Arizona attract well-off migrants, while California attracts a high percentage of foreign-born who have difficulty with the English language and tend to have low income levels. In general, long distance movers tended to be better off than short-distance movers.

The metropolitanization of older people has now continued for three decades. Preliminary data reported in FY 1984 showed that the period 1970-1980 had a net gain in metropolitan migrants, suggesting yet another reversal of metropolitan to nonmetropolitan turnaround in the balance of migration that had occurred between 1960 and 1970. However, in the process of journal review, a data processing error was uncovered. Published results now reveal that no reversal occurred between 1970 and 1980 and that the 1960-1970 trend continued up to 1980. This error does not affect the finding reported last year on "return migration."

- By 1980, some 78% of all migrants aged 60 years and over came from metropolitan areas, and 73% migrated to metropolitan areas. Moreover, by 1980 some 68-71% of moves also involved relocation in an equivalent (in terms of metro/nonmetro) environment, with only 17-18% moving from metro to nonmetro areas, and 12-14% from nonmetro to metro areas. The trend in elderly migration over three decades is increasingly one of migration from one metropolitan area to another.

- Preliminary results from a Small Grant project suggest important differences between fallers and nonfallers. Results from a small community-based study of 200 older adults drawn from groups with both active and sedentary life styles show, as is well known, fallers compared to nonfallers suffered more frequently from chronic physical impairments, particularly arthritis and cardiovascular diseases. Fallers were also more likely to be on anti-hypertensive medication, particularly diuretics. Most importantly, non-potassium-sparing diuretics showed especially strong relationships to falling while potassium-sparing diuretics were unrelated to falls (Reinsch, R03 AG04698).

  New findings from this study also have interesting implications for understanding other relationships among the musculature, the vestibular system, visual perception, disease, and falling. Fallers were more likely to be field dependent. An active group (Foster Grandparents) was found to be less distracted by the tilted frame than a more sedentary group. This active group also suffered fewer falls. While chronic health problems showed the strongest relationship to falling, the visual perception of the vertical remained correlated with falling after controlling for chronic health.

- The fear of crime, like the fear of falling, can produce a stark restriction in social activity. A Harris poll disclosed that the fear of crime was the greatest fear of the older population. A new study finds that the fear of crime among older individuals is related to violent crimes, like murder and robbery, and not to the total crime rate. Prominent local news stories appear to be strongly related to the fear of crime. This contextual analysis of how the structure characteristics of cities (such as their crime rates and economic, racial, and age composition) may affect fear of crime could produce clues to understanding phenomena as diverse as financial anxieties, migration decisions, and the development of social isolation (Liska, R01 AG04067).

- Preliminary results from a very small longitudinal study of the impact of involuntary relocation of persons 50 years and older living in single-room occupancy hotels suggest that some 30 months after moving there were no lasting negative effects on self-perceived physical, functional, and mental health (Eckert, R01 AG03809).

Age in Societal Structures

Work and Retirement

- Research is uncovering significant structural features of the labor market that make it difficult for older workers to find new jobs. The research is based on a recently developed economic theory of long-term contracts that suggests that employers and employees in certain industries find it mutually beneficial to form relationships in which young workers are offered lifetime employment. These jobs tend not to hire older workers even if they are qualified and productive. Preliminary results suggest that there are differences among industries and occupations in the tendency to hire older workers. Categories of jobs exist that do contain older workers but that have few "new" older workers. The project also finds that these jobs tend to have relatively long job tenures, with steeper wage profiles over the lifetime, and that workers are more likely to obtain a pension when they retire (Hutchens, R01 AG04259).

- Preliminary results from a project that seeks to explain the patterns in old age pensions has found that pension formulas have changed a great deal over time. For example, pension wealth values increased significantly between 1960 and 1970, both before and after taxes were taken into account. The study, using a complex algorithm for each of fourteen private sector pension plans, also found a change in the propensity to encourage retirement before and after age 65. In the 1960s, benefit plans discouraged early retirement and encouraged working after age 65. In the 1970s, pensions became more neutral. Between 1970 and 1980, annual and pension wealth values declined in real terms, in part because of inflation and a reduction of benefits for early retirees (Mitchell, R01 AG-4737).

  There are some indications that age discrimination legislation outlawing mandatory retirement has had an important effect on the structuring of pension benefits. By 1980 benefit profiles developed a more pronounced peak at age 62, with larger benefit reductions for those choosing to work beyond that age. This finding, which complements a similar finding reported in 1984 (Taubman, R01 AG00913), probably reflects the impact of age discrimination legislation. Employers who can no longer force workers to retire manditorily make retirement a more attractive option.

A number of factors are emerging to explain the variations in the extent of government support of older people in different countries. Preliminary results from a cross-national study of 150 countries for the years 1965, 1970, and 1975 suggest a complex picture. Among the factors affecting support are the number of years since the pension law was first enacted, the percentage of the population over age 65, family size, degree of industrialization, and degree to which the working class is represented in the government. The number of years since the pension law was first enacted shows consistently strong effects on expenditures. This suggests a possible bureaucratic momentum explanation in which the bureaucratic department administering the benefits grows in strength.

Socioeconomic Status

- An investigation of the impact of state and local taxation on older people in California, Massachusetts, and New York finds that although the elderly generally face lower state income taxes than the nonelderly of similar incomes, important differences exist across the three states. In California, which has no special exemptions for the elderly and no special treatment of income from capital, the average state income tax burden of the elderly is considerably lower than that of the nonelderly because much of the elderly population's income (such as social security and SSI) is not subject to taxation. Massachusetts, with a modified flat rate income tax, taxes unearned income at twice the rate of earned income, resulting in a pattern in which elderly earning less than $45,000 a year have lower effective tax rates than the nonelderly, while the relatively few elderly with incomes over $45,000 have higher average tax rates than high income nonelderly. New York, with higher income taxes for unearned income and an exclusion of the first $20,000 of pension income, has a lower effective rate for elderly taxpayers at every income level (Rechovsky, R01 AG0367).

  Preliminary results also show that because of the low-income circuit breaker in the California property tax code, the relatively immobile elderly households are taxed at low rates and face an average lower effective property tax rate than the nonelderly. On the other hand, in Massachusetts where there is no circuit breaker, many elderly face higher property taxes than nonelderly with similar incomes. These findings are important for understanding the after-tax income status of the elderly and for assessing intergenerational equity. Since tax rates are determinants of migration, the findings also add to our understanding of the migration patterns of older people.

- Many preliminary findings on the economic status of the aged reported in previous years (Maddox, R01 AGO) are detailed and elaborated in a monograph by Clark, Maddox, Schrimper, and Sumner entitled Inflation and the Economic Well-being of the Elderly, published by the Johns Hopkins University Press in 1984. Current research on this project, now supported by the Sandoz Foundation, extends the longitudinal analysis of these issues in the area of the impact of socioeconomic status and health expenditures on an index of functional impairment.

The Older Black Population

Accurate knowledge of the older black population has been hampered to some extent by poor data gathering techniques. A recent study has overcome some of these difficulties through new methods of identifying black households not only in high-density black areas but also in high-density white populations (Jackson, R01 AG01294; Chatters, F32 AG05297; Taylor, F32 AG05296). This study throws new light on life satisfaction, health, financial assistance, helper networks, and retirement in this population group.

- Most older black people report high levels of life satisfaction and happiness. Personal problems are more frequently reported by the young-old, by women, and by those with lower levels of education.
- Two-thirds of older blacks report more than one doctor-diagnosed health problem. The most commonly reported problems are hypertension and arthritis followed by nervous disorders and circulatory problems.
- Older black people receive little direct financial assistance from either family or friends. For nearly one-third, social security and SSI payments are the sole means of support. Continued work is the most common means of adding to their income.
- The more advantaged older blacks (those with higher income and education and younger age) receive more social supports than those whose needs are objectively greater.
- Few older black people are socially isolated. Ninety-five percent receive some social support through helper networks. Family members contribute goods and services, friends provide companionship, and church members give advice and encouragement, especially during illness.
- Among impaired older black individuals, daughters are the most frequently named "helpers" in the network, followed by a son or a spouse. Only three percent reported that they had no one to turn to in illness.
- The size of the helper networks does not appear to be related to health status.
- Retired blacks report high levels of well-being, personal control, and a sense of life accomplishment. Although their socioeconomic status is low, their positive adjustment appears to reflect relief from a lifetime of unfavorable work experience. In contrast, full-time workers with more economic security report lower levels of psychosocial well-being.

The Navajo

A preliminary study of Native Americans suggests some interesting findings (Kunitz, R01 AG03404):

- Older Navajo women who leave their native culture are at increased risk of hypertension in contrast to Navajo men for whom no greater risk is experienced. It is hypothesized that this difference is explained by the Navajo matrilineal family structure. In the larger society, Navajo women are required to make more major adjustments than Navajo men, who tend to be marginal in both cultures.
- In this study, which takes into account traditional Navajo and modern systems of medical care, older Navajo and non-Navajo populations do not differ in rate of help-seeking behavior.
- While the prevalence of depression among older Navajos does not appear to differ from the general population, it is suspected that this may be a false finding since the higher consumption of alcohol among Navajo men may result in underreporting.

Care of Frail Older People

Two new reports on care of the frail elderly have been received:

- Preliminary data from a study of frail elders and their caregivers in Massachusetts indicate that daughters and daughters-in-law are the most frequent caregivers to older women, whereas for frail men the caregiver is more likely to be the spouse. This study is also finding a higher rate of frailty than expected and is producing high response rates from both frail elders and caregivers (McKinlay, R01 AG03869).
- A pilot study in Israeli kibbutzim is demonstrating that when informal and formal support systems are integrated, the need to assign the frail elderly to long-term-care facilities is sharply reduced (Holmes, R01 AG03869).

Older People and Social Institutions

Family: Grandparents and Grandchildren Following Divorce

A major study of grandparent-grandchild relations following a divorce in the middle generation has produced a number of findings (Cherlin, R01 AG02753):

- Most adult children who experience marital difficulties tend not to consult their parents until after the decision to divorce has been made, at which time the grandparents, especially those living nearby, are often called upon for substantial assistance.
- In general, after divorce, the relationship between maternal grandparents and grandchildren becomes deeper and stronger while relationships on the paternal side are weaker.

- When step-grandparents are involved, the relations to grandchildren depend upon the age of the children when the step-grandparents were "acquired." If the relationship was developed when the children were very young and regular contact maintained, the relationship is nearly indistinguishable from a natural grandparent-grandchild relationship. If the children were older, the relationship is more often reserved.

Family: Siblings as Caretakers of Older Parents

- A study of pairs of daughters of older parents finds that the siblings usually do not name one or the other as primary caregiver. Arrangements considered equitable are negotiated among siblings.

- If two daughters are potentially available, the fact that one works does not "excuse" her. It is rather a question of when, rather than if, the working daughter will assume some measure of responsibility (Matthews, R01 AG03484).

Age in Work Organizations

A study of age-associated career perceptions of professional employees in a large work organization is showing a number of relationships between employees' expectations, work satisfaction, and performance ratings (Lawrence, R01 AG04615):

- Employees' perceptions of age and career stage exert subtle influences in work organizations. There tends to be a mismatch between employees' perceptions of age distributions in organizations and the actual distributions. These perceived distributions tend to produce "normative schedules" (group level expectations) for performance and promotion.

- The likelihood of high performance ratings increases for people who are younger than the normative schedule at various points in the career ladder. Similarly, the ratings tend to be lower for those who are older than the normative schedule suggests.

- Employees who see themselves as behind schedule for their current level in the organization express less work satisfaction than those who see themselves as on or ahead of schedule.

- These findings suggest two prescriptions for improving employee performance in an organization: 1) each level should be formally defined to include broad age categories, and 2) lateral transfers should work to reduce the time spent at any one level.

Overview of Program Plans, FY 1986-1989

Age in the Population

FY 1986. Several areas of activity are planned for the coming year in connection with both the grant program and the broader development of the science. First, the June 1985 workshop on "The Methodologies of Forecasting Life Expectancy" is expected to lead to a number of activities. A volume partially based on the workshop is planned for summer 1986. A program announcement or RFA will be issued on the topic, jointly if possible, with NICHD and the National Cancer Institute (NCI). A second workshop in the series is in the very early stages of planning. This workshop will encourage the development of actual models to forecast active life expectancy and the morbidity of the elderly for year 2000. Preparatory work on the workshop will begin in FY 1986, and the workshop will take place in FY 1987.

Second, a series of coordinated activities is planned on the "Oldest Old," based on the response to the program announcement on this topic issued in FY 1984.

In order to stimulate further cross-national research and collaboration on the old and very old, a symposium on "International Perspectives on the Very Old" was held at the 1985 meeting of the International Gerontological Association. A volume and article based on the meeting are planned for 1986.

The interagency agreement with the International Division of the Bureau of the Census, which provides for the production of an international database on aging for distribution to the scientific community, will result in the availability of this database in FY 1986. Included in the database will be a standardized set of tabulations on older populations across a large number of countries.

A program announcement to guide research utilizing the Census Bureau's international database will be considered for issuance in FY 1986 or FY 1987.

Several other activities aimed at drastically improving the availability of valid and reliable data on the oldest old are both in progress and planned, in coordination with the initiative in "Research Methods and Data Resources." The interagency agreements with the Census Bureau to create special data tapes and tables for the 1980 Census will make available to the scientific community in FY 1986 a considerable additional volume of 1980 Census data on the elderly population in general as well as on the oldest old. These agreements also provide for partial assessment of the quality of the data.

A series of additional interagency agreements with the Census Bureau is planned to develop more data on the elderly and the very old. They include a three-year pooling of CPS data to generate reliable estimates on the oldest old, augmenting the age 75 and over sample of SIPP and the issuance of an annual data report. A series of conferences on the data being developed through these argeements and other attendant methodological issues is being considered, and an RFA may be issued.

Data resources being prepared under interagency agreements with NCHS will also serve as foci for these data conferences and the proposed RFA. An FY 1985 interagency agreement with NCHS provides for the development of a unified tape on the health of the elderly that will allow for both trend and synthetic data cohort analyses by five age groups. In FY 1986 this data set will be extended by including data from years prior to 1969 (with special computer programs to handle the pre-1969 UNIVAC tapes). The followup of those over age 70 and half of those aged 70-79 from the Aging Supplement to the 1986 NHIS that was begun in 1985 will be completed in FY 1986 or FY 1987. This survey will also be linked to the National Death Index and HFCA files.

Efforts are also being made to develop training programs in the demography of aging and the epidemiology of aging in conjunction with the Bureau of the Census and NCHS respectively. The programming efforts that were begun in FY 1985 to develop small planning programs in the demography of aging through cofunded, complementary, and regular training grants will continue in FY 1986. If the efforts are successful, a meeting of trainees is planned for the 1986 meeting of the Population Association of America.

A grantee workshop originally planned for FY 1985 on "Trends in the Migration Patterns of the Elderly" and the melding of traditional descriptive approaches with new mathematical models was postponed to FY 1986 or later. This workshop will also consider the economic and health-related impact of migration and return migration. Consideration will be given to the most suitable mechanism for more finely focusing NIA's funded research on migration.

FY 1987-1989. The basic thrusts planned for FY 1986 are expected to continue into FY 1987-1989. The possibility of stimulating important research on the oldest old will be highly dependent on the removal of the most significant barrier, the absence of adequate data. This same precondition will be true for the successful advancement of cross-national comparative research on the changing characteristics and population dynamics of the older populations in other industrial nations.

Special seminars are planned to train investigators in the correct usage of the forthcoming data sets on the elderly populations from several key NCHS surveys, and BSR staff will collaborate with NCHS on the analysis of the data.

Workshops will be held to report results from the studies encouraged by the program announcement on the oldest old, and additional edited volumes on this population will be prepared. At this time there should be sufficient information to assess the progress of the initiative and to move away from the descriptive stages to more focused hypothesis testing. In cooperation with the Fogarty Institute and possibly with the IIASA and Committee for International Cooperation on Research in Demography (CICRED), an international conference is under consideration on cross-national comparisons of aging populations for FY 1988 or FY 1989. In many of these projects, active collaboration with NIA's Epidemiology, Demography, and Biometry program will be sought.

Age in Societal Structures

FY 1986. A number of developmental activities begun in FY 1985 will come to fruition in FY 1986. During the year, staff will review ongoing and completed studies as well as the general literature on differential patterns of social support and care of frail older persons. A workshop for grantees is also being considered, along with an NIA-supported publication. Cross-national research in this area will be encouraged.

Understanding the implications of the population changes for the opportunities and constraints imposed by society is a central and over-arching concern of this section. Clearly these changes will have a series of major impacts on social structures, with the consequences then feeding back and affecting the well-being of older people themselves. An outside expert was brought in to consult on this issue in FY 1985, and a number of activities will be undertaken in response to the outcome of this review.

Staff has also been involved with a nascent effort to model these consequences empirically. This modeling effort was commissioned by the Senate Special Committee on Aging to help plan for the needs of the future elderly in several sectors. In conjunction with this effort, a BSR staff member also participated in a panel on "An Aging Society" sponsored by the NAS. Economic researchers and demographers have been encouraged by staff to continue research in these areas, and requests for conference grants, guided by staff, will be used to further develop these areas in FY 1986.

A workshop on "Modeling the Impact of Changing Age Distributions" to evaluate the various methodologies involved in the empirical assessment of the impact (including modeling or simulating studies) will be planned in FY 1986 and held in FY 1987. This workshop will follow up the workshop on "The Methodologies of Forecasting Life Expectancy" held in June 1985 by the AIP section.

There is considerable controversy surrounding attempts to model the dynamics of the changing older population and the social and economic impact of this change. While general systems models are in disrepute, there is also little agreement on the validity of economic-demographic models and on the incorporation of micro- and macrolevel data within the same model. A workshop designed to sort out these many issues in relation to the aging population and the concerns of the older is planned for FY 1987, or later, with some early developmental work to begin in FY 1986. The primary utility of this workshop is not seen as the development of an actual model, but rather as a heuristic exercise to alert investigators to important areas or relationships between the changing demography and the social structure that need research.

One singularly important model in the field is the Macroeconomic-Demographic Model maintained by NIA's EDB program, which has agreed to support and participate in this workshop. Certainly an important by-product will be the opportunity for the scientific community to be exposed to the EDB model. The workshop will also build on a number of grantee studies on the economics of aging as well as the rudimentary model developed for the Senate Special Committee on Aging. It is anticipated that the increased activity in this area, especially after sensitivity analyses have been conducted, will result in the ability to target and prioritize research in this section more effectively. An advisory group will be convened to consider the development of activities related to the "Economic Well-Being of the Elderly." As noted above, a number of grantees are working in this area, both in this section and in AIP. The improved economic status reported by a number of current and past grantees for the general elderly population, though not for significant elderly subgroups, raises a number of important concerns, including the adequacy of the definition of the poverty line for older people; the paths to poverty; the interrelationships between poverty or near-poverty and health; and other issues related to welfare, health, and labor market economics, such as lifetime earning patterns, changes in consumption patterns, income maintenance programs, assets over the life course, bequests, etc. Based on review papers commissioned by this section, a workshop will be developed that brings together grantees and a number of leaders in these fields to review progress and help map out priorities for future research. As an alternative to an advisory group on the topic of economic well-being, a similar working group on the health economics of aging is being considered.

Another important issue is age discrimination. With the increasing number of lawsuits filed under the various Age Discrimination Acts, this issue is rapidly becoming important, but with a negligible science base. This topic is important to another overriding initiative, still in the developmental and conceptualizing phase, i.e., the relationship between labor markets, productivity, human performance, and aging. As a start, a paper has been commissioned on the relationships among salary, productivity, and aging.

An important factor to be considered in the development of the AIS section is the likely emergence of the data from the SIPP as a major data set in the social sciences during the 1980s and 1990s. Should NIA be able to augment the number of the very old in this survey, it is envisaged that analyses of SIPP will become a major focus of this section, with the importance of this data becoming greatly magnified during subsequent years.

FY 1987-1989. The workshops to be held in FY 1985 and FY 1986 should generate considerable activity in these years. A multidisciplinary workshop on "Intergenerational Convergence and Divergence of Interests" will be held in 1987. It is designed to assess the causes and consequences of intergenerational solidarity and is now in the very early planning stages. This area is seen as a "sleeper problem" for society, and it seems wise to begin planning for research at both the macrostructural and institutional levels. Development will build upon a recent seminar on this topic and a series of papers commissioned by the Population Committee of the NAS. Consideration will be given to co-sponsorship and development with NICHD. A meeting and possible publication on cultural variations in patterns of social support and care of frail older people is planned. Cross-national research will continue to be a focus.

Older People and Social Institutions

FY 1986. Several program development activities in this area are planned for FY 1986. Building on the informal workshop on aging and formal health care held in September 1985, staff plans to commission papers suitable for publication and to produce an edited volume. The conference and resulting publication are intended to stimulate research on the relationships and interactions between older people and various kinds of health care organizations and practitioners as they affect health promotion, disease prevention, longevity, social functioning, and the ability to live independently. Commissioned review papers and planning meetings are planned within the areas of family relations and housing and living arrangements.

Also during the year, an informal workshop on aging and work organizations will be planned for FY 1987. Although the BSR program supports a number of studies on work and retirement, very few studies have addressed these issues at the level of the firm or work organization. The long-term objective of this informal workshop is to develop topics for research on aging and work organizations, with particular attention to the health, well-being, and effective functioning of workers under changing conditions in the nature of work and age composition of the work force.

FY 1987-1988. The workshop on work organizations will be held in FY 1987 and a program announcement released in that year. Follow-up activities from the development activities focusing on the family and on housing and living arrangements will also take place during these years. They may involve arranging sessions at scientific meetings, producing an edited publication, or preparation of an article by staff. The research supported in the OPI section will continue to be assessed and plans made for further scientific contributions.

Social Psychological Aging (SPA)

In contrast to the social-structural focus of OPS, research in this cluster focuses on the aging individual. It aims to understand how psychosocial and physiological aging processes interact with the roles and relationships through which individuals move as they grow older and to identify the social-environmental conditions under which health and functioning can be maintained or enhanced through the middle and later years. It also emphasizes longitudinal and cohort analyses.

Developmental Activities and Achievement, FY 1985

Psychosocial Aging (PSA)

This section supports research and training on changes and stabilities with aging in the effective functioning, productivity, attitudes, personality, and interpersonal relationships of individuals as related to the social environment. It includes cohort and longitudinal studies on the relationship between aging and such topics as stress and coping, social supports, personality traits and processes, social perception and emotion, attitudes, self-image, life satisfaction, life-course transitions and interpersonal relationships, and social change.

The Grant Program

Outstanding additions to the grant program this year included the establishment of a major research program at the University of Wisconsin in affiliation with Harvard University and initiation of an excellent training program at Pennsylvania State University in methodology for research on aging. Moreover, a significant program project on productive behaviors and aging as well as a social work training grant at the University of Michigan were funded.

Program development was conducted mainly through written, telephone, and personal consultation with grant applicants and grantees. Most consultations occur at NIA, with a few combined with project site visits or conducted at professional society meetings or at local universities. Through these discussions staff provided technical advice on both topics and research methods in an effort to improve the quality of applications submitted to the NIA. A procedure was developed for presenting the BSR program to sizable groups, and feedback has been highly positive. As one outgrowth, a paper was written about the program and published in the Journal of Academic Psychology. It is regularly circulated in reply to the many inquiries received by BSR staff.

In the grant program, several themes have emerged mainly in response to earlier broad program announcements or to special announcements on retirement and bereavement. Thus, several innovative prospective longitudinal investigations of adjustment to and consequences of spousal bereavement continued to be funded, with additional new studies commencing during the year. These studies are producing a set of provocative findings that challenge earlier conceptions of bereavement's impact on older people and were highlighted in the 1984 NIA Special Report on Aging. As the results accumulate, they should form the basis for a BSR publication on this topic and for filling gaps in existing knowledge through a revision of the 1978 program announcement.

A second set of longitudinal projects on retirement focuses attention on the social or organizational context that influences the decision to change jobs, retire partially or completely, or return to work after retirement. These longitudinal studies complement other BSR research on work and retirement (as in the social structure analyses in OPS and the relation to aging and health in BAH). Results from these SPA and OPS studies, as well as discussions held at the FY 1983 grantee meeting, provide the basis for future BSR publications and a revision of the 1978 program announcement on retirement.

Another area of activity consists of research on factors affecting changes and stabilities in such significant attitudes as sense of personal efficacy, self-esteem, life satisfaction, and political orientations, all of which are known to influence the health, effective functioning, or status of older people. Finally, a set of highly divergent studies centers around issues in social relationships or social support. Since many of these studies are newly funded, results should be forthcoming over the next few years.

Scientific Development

This section serves as the focal point within BSR for the development of research methods and research resources, which are of central importance both to BSR and to NIA as a whole. Given the costs in dollars and time required to mount large-scale longitudinal projects, staff has sought to stimulate secondary analyses of existing data and the addition of relevant variables or samples to ongoing longitudinal studies.

During the past year, staff has worked closely with the principal investigators of the National Archive for Computerized Data on Aging (NACDA) through a Specialized Center Grant to the University of Michigan. NACDA has continued to expand its holdings and formed advisory groups to develop concentrations in particular substantive areas--the oldest old, minority aging, international comparative studies, and biomedical studies. In order to publicize the availability of data sets of programmatic interest to the NIA, NACDA prepared a special listing of its holdings on the oldest old. BSR distributes this listing in conjunction with its program announcements on this topic. Thus, grant applicants are simultaneously informed of NIA's interest in an area and of possible relevant data sets. In recognition of the significance of NACDA, NACDA staff demonstrated the capabilities of the archive to the NIA's National Advisory Council at its February 1985 meeting.

In order to sustain the invaluable social science contributions to the quality of research on aging, BSR initiated a series of meetings on "Methodological Issues in Longitudinal and Cohort Research" in collaboration with NIMH. The goals of this initiative are to support innovations and improvements in the analytical tools available for exploiting longitudinal research designs and to encourage the more wide-spread utilization of appropriate analytic approaches. Via a small interdisciplinary core group of methodologists supplemented by ad hoc consultants, two kinds of activities were implemented. One is a series of advanced, technical seminars aimed at identifying, discussing, and evaluating leading-edge developments pertaining to design and analysis issues. The first two such seminars, on time series and event history analyses, were held in January and May, 1985.

The second activity is the organization and presentation of a series of workshops or tutorials designed to disseminate relatively novel and innovative but proven methodological tools to investigators who are either engaged in or intending to begin longitudinal research. In addition, a set of annotated bibliographies is being prepared for distribution to NIA grant applicants and grantees in order to guide their self-instruction in the design and analysis of longitudinal and cohort studies.

As a means of improving the quantity and quality of data available to the research community, BSR is contributing to the "Study on Statistics for Policy Analysis for an Aging Population," which is being conducted by the NAS Committee on National Statistics through an interagency agreement with NCHS. The study assesses the adequacy of current statistical information and methodology, particularly in the area of health and medical care, for research and policy. As a result of its first two meetings, the NAS study panel decided to prepare reports on "Health and Related Issues and Associated Data Requirements," "Statistical Methodology for Health Policy Analysis," and "Improvement of Data Resources for Policy Analysis on Aging," which were presented in September 1985 at an NAS conference. In addition to preparing these three reports, the NAS study is compiling an inventory of longitudinal data sets concerned with health and aging. This inventory will be made available to the research community in machine-readable and hardcopy form through either the NIA or NACDA.

In a related effort, BSR continued to assist in the development of a research agenda for the social and behavioral sciences for the next decade through its contribution to the NAS Committee on Basic Research in the Behavioral and Social Sciences. Various substantive and methodological issues are being addressed by the NAS Committee that are of direct relevance to BSR as a whole (e.g., cognitive processes, health and behavior, large-scale databases, statistical analysis, family and domestic relations, demographic change, and formal and legal processes). The resulting reports should aid in the identification of appropriate programming efforts at NIA.

Another means for improving the quality of available data is the addition of topics to ongoing longitudinal studies. After providing partial and mainly symbolic support to the University of Michigan's Panel Study of Income Dynamics (PSID) and pressing for the inclusion of health-related questions, BSR received a request from the PSID for just such an addition to its 1986 survey wave. The PSID will add about five to eight minutes of health-relevant questions to the head-of-household interviews, concerning the head-of-household's health and that of his or her spouse. Although not part of the current plan, these questions could be repeated during a future wave. An ad hoc advisory group has been formed to consult with PSID staff in conceptualizing and operationalizing health measures. This effort will provide a significant longitudinal resource to both intra- and extramural investigators.

Biosocial Aging and Health (BAH)

This recently created and rapidly growing section supports research and research training on how social and environmental processes, interacting with biological process, influence health and physical functioning in the middle and later years. It includes: 1) cohort and longitudinal studies of psychosocial predictors of morbidity and mortality; 2) dynamic interrelationships between health behaviors and aging, including antecedents and consequences of health care behaviors as well as sociobehavioral mechanisms and interventions for health promotion and disease prevention across the life span; 3) perceptions of and responses to chronic diseases and disabilities with aging; 4) interplay among life transitions, health, and aging as a process; and 5) special psychosocial and physiological aspects of aging among women. It complements BRCM in providing linkages between social contexts and biomedical changes with aging. As compared to research in the Older People and Society Cluster, the emphasis of the Biosocial Aging and Health Section of SPA is on the aging individual and the processes of health and aging.

The Grant Program

There has been remarkable growth over the past few years in this relatively new section, which emphasizes the health component of the social psychological aging process. There are now approximately 50 grants, some of which are already beginning to provide an important empirical base for understanding how social and environmental processes influence health and functioning as individuals grow older. The development of research grants, traineeships, and fellowships has been stimulated by the more recent program announcements in

"Behavioral Geriatrics Research" as they further refine the earlier broad program announcement on "Health and Effective Functioning in the Middle and Later Years."

A variety of activities, some in collaboration with BRCM, have been undertaken to further programmatic and scientific development in the area of biosocial aging and health. Program development activities include identification of high priority research needs in this area; recruitment of likely grantees through widespread dissemination of program announcements and through program presentations at national meetings; and review and evaluation of preliminary prospectuses.

These activities have resulted in a range of grants, focusing on aspects of behavioral geriatrics research and several other emerging themes, as follows:

One set of studies aims to specify the dynamic interrelationships among aging and health behaviors. Several studies have begun to focus on how aging processes interact with health care attitudes and behaviors to influence health and functioning over the life course. Of special importance here are studies that examine antecedents and consequences of different types and levels of health care utilization. Going beyond analyses of postulated interrelationships, a few investigators are developing and testing sociobehavioral strategies for promoting desirable health attitudes and behaviors and eliminating unhealthy ones.

Another set of studies examines how older people perceive and respond to chronic illnesses and symptoms. Some studies are focused on understanding the day-to-day context of symptom experience and health-related behaviors of older adults living in the community. Others are concerned with how patients, families, or health care providers' definitions of aging and illnesses impinge on older peoples' coping with chronic disease. Still others examine individual, familial, and medical care predictors of recovery or rehabilitation in old age. Representing different anthropological, social, or epidemiological approaches, these investigations have the common goal of understanding the social components of the course and consequences of serious illnesses affecting elderly individuals.

Several longitudinal studies are examining the influence of life transitions and stresses on physical health and functioning. These studies extend previous knowledge of the role of mediating psychological and social factors in the elderly by developing more rigorous measures and by exploring links between psychosocial conditions and psychophysical responses.

Another set of studies is examining myths and realities of good health and well-being among women as they age. These investigations are delineating specific research questions related to gender differences in health and longevity, examining special life course transitions for women, and identifying data sources suitable for addressing these research questions.

Still another set of prospective studies follows selected individuals for extended periods of time to identify psychological characteristics, social roles and relationships, or health practices that are associated with the early occurrence of illness or mortality. These studies include the well-known Johns Hopkins Precursors Study and follow-ups of the Alameda County and the Cleveland General Accounting Office Studies. They provide a basis for examining the dynamic interrelationships of psychological, social, behavioral, and health factors as individuals age, and they suggest possible interventions to promote health and forestall further disease processes.

A member of this section also serves as project officer for an interagency cooperative agreement on "Prevention of Falls in the Elderly" awarded to Kaiser Permanente Research Center. The subject of this project fits within and nicely complements research in this section, focusing on the dynamic interrelationships among aging, health, and behavior. As with the ongoing multisite trials of behavioral treatments for urinary incontinence, this initiative requires that staff to be actively involved in the development, implementation, and evaluation of scientific protocols. This three-year research program is jointly funded by HCFA, NIA, and the Robert Wood Johnson Foundation.

Program Review Activities. Program development activities in FY 1985 also included a preliminary review of some of the emerging subareas. For example, a social epidemiologist was asked to review the cluster of socioepidemiological grants focused on psychosocial predictors of morbidity and mortality. The purposes of such a review were to place NIA-funded grants within the greater context of the field, to evaluate the soundness and validity of emerging findings, and to make suggestions regarding the most fruitful directions for future research.

Since the new initiative in "Gender Effects on Health and Longevity" is important to this program, an outside consultant was identified to do a background review in this area in preparation for a program announcement in FY 1986 or FY 1987.

In addition to onsite consultations, advisory group members were asked to prepare internal reports for staff purposes. These activities will be continued in FY 1986 and 1987 and eventually lead to full-length publishable papers.

Intra-BSR Activities. In addition to program responsibility for research on health and illness behaviors from an individual aging perspective, staff in this section is collaborating with OPS to develop program initiatives in "Aging and Formal Health Care." Developmental activities in FY 1985 included an initial planning session for a conference in this area and plans for a grantee workshop to be jointly sponsored by NCHSR. Four general areas that cut across SPA and OPS areas of interest have been identified for programmatic attention: 1) provider-patient interactions; 2) antecedents of health care utilization; 3) health care organization; and 4) social and behavioral aspects of institutional care.

Joint BSR-BRCM Activities. A member of this section continued to serve as the focal person in BSR responsible for the social and behavioral aspects of the Institute's Teaching Nursing Home (TNH) program. While the potential for related behavioral sciences research projects has only begun to be realized in the existing TNH projects, by combining TNH activities with other program activities, BSR staff made several program site visits in FY 1985 for the purpose of monitoring ongoing projects and stimulating additional social or behavioral research.

At a fall planning meeting of TNH principal investigators held in conjunction with the GSA meetings, there was overwhelming consensus that a mechanism was needed to facilitate information exchange across sites. In response to this need, BSR staff compiled and sent abstract folders on each project within the seven currently funded sites. Investigators at the Case Western site have received funds to develop and disseminate a TNH newsletter.

The "Clinical Trials of Behavioral Therapies for Urinary Incontinence in the Elderly," jointly developed and sponsored by BRCM and BSR in collaboration with the Division of Nursing, HRSA, went into the field. BAH staff is contributing behavioral sciences expertise to this initiative. Several of the sites are testing sociobehavioral interventions that are similar to those being investigated in other BSR research projects. As a cooperative agreement, this initiative requires active consultations on protocols, research design, and analysis of findings. Several intersite meetings have already been held to discuss common protocols and measurements. The first scientific presentation, which will provide an overview of the ongoing projects, was held at the Society of Clinical Trials meeting in the spring of 1985.

A third area of collaboration involves the Alzheimer Disease Research Centers initiative. While the Neurosciences of Aging Branch of BRCM has major responsibility for this initiative, BAH staff is involved in developing and monitoring behavioral sciences aspects of the research. For example, to highlight the Institute's initiatives on Alzheimer disease, a symposium on current "Federal Research Activities in Alzheimer's Disease" was arranged for board members and advisors of the Alzheimer Disease and Related Disorders Association. Furthermore, building on the comprehensive state-of-the-art paper on "Families, Informal Supports and Alzheimer's Disease" prepared by the NIA Working Group in FY 1984, BAH staff made several program presentations on current behavioral sciences research and promising research agendas in this area. A specific concern of this program is to stimulate high quality research in this previously neglected area. A targeted program announcement on social and behavioral aspects of Alzheimer disease is being considered for release in FY 1986 or FY 1987.

Scientific Development

During 1985, staff continued to be engaged on many fronts in synthesizing theory and research relevant to BAH and to BSR as a whole and in identifying high priority research needs. The primary developmental activity this year involved the organization of a variety of outside scientific symposia to disseminate emerging research findings in this area. This activity was implemented in several different settings.

A symposium on "Health and Illness Behavior in Middle and Later Life" was planned for the annual meetings of the American Sociological Association. This symposium provided a forum for NIA funded investigators to present their conceptual frameworks, methodological approaches, and most recent findings.

A staff member served as 1985 program chair for the Gerontological Health Section of the American Public Health Association and planned over 20 scientific sessions relevant to research, practice, or policy aspects of aging and public health issues. While the scope of this program is much broader than the NIA's mission, sessions were included on major NIA initiatives such as the maintainence of health and effective functioning, the oldest old, gender effects on health and longevity, and geriatric research and care issues.

Staff is providing consultation to the Gerontological Society of America's newly created Task Force on Women's Health and Longevity. One of the long-term goals of this task force is to prepare a state-of-the-art monograph for public dissemination.

Staff is also providing advice on the content and format of a nursing instrument to assess self-care behaviors of older people residing in a community setting in conjunction with the self-care research project funded by the Division of Nursing, HRSA, at the University of North Carolina.

A staff member was invited to participate on a Working Group on Health and Behavior for the NAS Committee on Basic Research in the Behavioral and Social Sciences. The tasks of this group are to prepare a ten-year outlook on research opportunities with attention to: 1) the most prominent advances in knowledge; 2) exemplary research frontiers; 3) the identification of existing resources; and 4) recommendations for resources needed beyond those currently available to encourage advances in knowledge over the next ten years.

Staff is assisting the World Health Organization to develop and coordinate multicentric research on community-based interventions for mitigating negative effects of psychosocial problems in older people. Specifically, an international planning meeting will be held to standardize interventions and methodologies for coping with problems such as bereavement or relocation in cross-cultural contexts.

Research Highlights, FY 1985

Psychosocial Aging

A variety of longitudinal studies indicates how particular characteristics of jobs have significant impact upon psychological functioning and productive behaviors over the life course. This research provides insights as to how social environments, including the work place, might be adjusted to maintain the motivation and performance of people as they age.

- The degree of autonomy that a job allows a worker has a direct effect upon changes in the worker's self-esteem, job satisfaction, and commitment to work. While the effects appear to be strongest for young workers just beginning their careers, work autonomy also affects the attitudes of older men and women towards themselves and their jobs and, thus, their desire to continue to be employed. In sum, this research demonstrates that jobs shape attitudes and behaviors throughout working life, even during the immediately preretirement stages of occupational careers (Mortimer, R01 AG03325).

- While most studies of the effects of work are limited to males, research under a New Investigator Award suggests that paid employment has positive benefits for self-esteem, mental health, and physical health of middle-aged and older women as well as men (Coleman, R23 AG04285).

- Jobs influence the desire to continue working not only through their effects on attitudes and motivations, but also through the opportunities for work they afford workers as they age. Older workers' best chances for continuing in the labor force are in occupations characterized by substantive complexity, high levels of social skill, and low physical demands (so-called "primary sector" jobs). Such jobs provide workers with a greater range of choices than other jobs, such that incumbents are either more likely to retire early (before age 62) or, if they stay in the labor force, to continue working beyond normal retirement ages (Hayward, R23 AG03139; Hardy, R01 AG04258).

Several longitudinal studies on spousal bereavement continue to highlight the ability of older people in general to adjust fairly rapidly to the loss of a spouse. They are also beginning to specify the conditions under which adjustment is more problematic. For example:

- One study has been following about 200 bereaved men and women over the first two years after their spouse's death, and less than a fifth of them experienced major difficulties associated with stress, coping, and depression. The survivor's sense of self-esteem proves to be the best overall predictor of positive adjustment to bereavement. Moreover, when adjustment is difficult, it may reflect an undermining of the survivor's sense of social belonging and clarity of self-concept, which are in turn linked to self-esteem. While major adjustment problems are rare in this sample, the most common and persistent complaints center around loneliness and practical difficulties of everyday life (e.g., home repairs, balancing the checkbook), which had presumably been the duties of the deceased spouse (Dimond, R01 AG02193).

- Similarly, another longitudinal study is finding that survivors experience less depression (over the first 13 months after bereavement) in instances where a) the spouse and survivor shared social and recreational activities, b) more preparation for bereavement had been made by way of discussing wills and finances, and c) there was more involvement by the survivor in providing help with daily activities during the spouse's last illness. More depression was experienced where a) the death was sudden and unexpected, b) the survivor expressed a desire to have done things differently, and c) the survivor was looking for, but could not find, work to do following the spouse's death. Taken together, these patterns suggest that adjustment is easier when there have been specific preparations for bereavement and where the survivor has a sense of closure in regard to his/her relationship to the deceased (Faletti, R01 AG02061).

Biosocial Aging and Health

New analyses from several well-known longitudinal studies are adding to knowledge about the influence of recommended health practices and life style factors on morbidity and mortality in the elderly:

- o The relationship between health-related practices and health outcomes is dependent on the proper measurement of the duration and timing of particular behavioral risk factors. As shown in a rigorous longitudinal study, coffee consumption measured at different times over the life course is associated with the onset of different chronic illnesses: 1) coffee consumption in one's early twenties was not predictive of either coronary heart disease or coffee-related cancer; 2) average lifetime coffee consumption was related to these cancers; while 3) current coffee consumption was related to coronary disease (Pearson, R01 AG01760).

- o A study of Seventh-day Adventists casts added light on the relative influence of genetic and behavioral factors accounting for mortality. Favorable health practices and parental longevity were found to be independent and additive factors in all-cause mortality (Kuzma, R01 AG01582).

- o The question of whether the risk factor picture changes with aging has gained increased attention in recent years. The failure of some epidemiological studies to find significant relationships in older people between a variety of health practices and mortality outcomes had resulted in a questioning of the value of recommending health habits or health behavior changes in older populations. However, new analyses based on a study of a large representative sample of adults in a typical urban county (Alameda County), demonstrate the continued importance of traditional behavioral and social risk factors for predicting mortality even among those aged 70 and over (Kaplan, R01 AG04610).

The nature of the well-documented relationship between social support factors and individual health outcomes is much more complex than previously thought:

- o Social support factors operate differentially across age categories in line with age-related life situations. In one longitudinal study unmarried persons were found to be at higher risk for subsequent mortality only at the younger ages where widowhood is generally less prevalent. On the other hand, social isolation from friends and relatives was consistently associated with greater risk of death for persons of all ages. The longitudinal nature of this study will establish the causal direction of social factors on health outcomes (Kaplan, R01 AG04610).

- o The existence of a dose-response relationship between social support and health is challenged by new evidence suggesting instead a threshold phenomenon. Lower survivorship was most characteristic among those with only minimal social ties (Schoenbach, R01 AG03518).

- o "Perceived" control specifies the relationship between social ties and health status, especially for those with minimal social ties. Controlling for age, sex, and social class affiliation, persons who are characterized as having an "external locus of control" apparently make comparatively less use of the support and resources available in their social networks, and this is reflected in their poorer health indicators (Hibbard, R23 AG03824).

- People with more social ties engage in a greater number of health-promoting behaviors. The link between social ties and health behaviors appears to be greatest for older people (Hibbard, R23 AG03824).
- Retirement does not necessarily mean a reduction in the availability of social supports associated with health maintenance. The overall number of friends is the same or more after retirement. While work-related supports are often maintained into retirement, non-work-related social supports such as relatives and friends increase in importance after retirement (Bosse, R01 AG02287).
- Acute disabling events, such as strokes, do not necessarily affect the size of social networks. Data from stroke victim-caregiver dyads indicate that, at least in the short run, stroke victims are not abandoned by their social support networks (Schulz, R01 AG04349).

Continued analyses from the well-known General Accounting Office Health Survey are shedding light on stabilities in health assessment over time and providing additional information on gender similarities and differences:

- Self-assessments of health among older people tend to be stable at least over the short-term, thus challenging the common assumption that such assessments decline with age (Ford, P01 AG04391).
- Although women outlive men, gender differences in the quality of that longer life are not well understood. Women appear to be worse off than men in terms of cognitive functioning and other health status assessments at the oldest years. However, in limitations on capacity for activities of daily living, there is some convergence between women and men after age 85 (Ford, P01 AG04391).

Two studies are adding valuable information about the interactions among stressors, mediating psychosocial factors, and physical health outcomes.

- The well-documented relationship between stress and negative physical/mental health outcomes varies by type of stress experienced. In a large community study of stress, resources, and health of the aged, personal frustration appeared to be more strongly associated with negative health problems than other objective or subjective measures of stress (Kahana, R01 AG03238).
- A study of physical disability and coping among older black women suggests a black-white difference in the accuracy of reports of physical functional limitation on social health. Self-reports of functional limitations by older black women are multiply influenced by a combination of factors, including social stratum, physical health, mental health, general health perceptions, and the nature of the group or individual methods employed to

cope with distress. However, blacks are more likely than whites to report functional limitations that are discrepant with reports of social activities and social health. That is, black women are more likely than white women to say that they are sick, but be involved to a large extent in various types of social activities (Gibson, R23 AG03553).

Studies of antecedents of health care services among older people are supporting previous findings regarding the importance of need factors in predicting actual usage. Further examinations of data from national health surveys are extending previous knowledge about the behavioral model of health services utilization:

- o Recent analyses, which employ new methodological techniques to correct for the non-normally distributed physician and hospital utilization measures, show the behavioral model to be most accurate in predicting the use of health services among modest to moderate users as opposed to heavy users. Indepth analyses suggest that this difference is due to the compression of the significantly larger, nondiscretionary component of health services among heavy users (Wolinsky, K04 AG00202).

- o An examination of the patterns and levels of physician use in an older Canadian population shows that only a slight majority of older persons (60 percent) are "consistent users" of physicians. No discernible differences were observed between consistent and inconsistent users. Among consistent "low" users, after controlling for objective health status, factors such as the availability of physicians and physician patterns of practice were seen as important determinants of utilization among generally low users. In contrast, among the consistent " high" users, only health status characteristics (poor health) and sex (being female) appeared important determinants of utilization (Mossey, R01 AG03762).

- o Factors related to the use of medical services are somewhat different for older than for younger adults. Analyses of utilization rates in a prepaid HMO system showed that enabling factors play a greater role in the utilization rates of older adults, while predisposing factors are more important in determining use of medical care among younger adults (Hibbard, R23 AG03824).

Two new pilot studies are producing suggestive information on little-studied aspects of health care and functioning in older people:

- o An anthropological study of pharmacist-client encounters indicates that few people of any age request advice from pharmacy personnel. Persons utilizing an apothecary-type pharmacy are more likely to ask advice than those going to a community pharmacy or a chain (Gibbs, R03 AG03480).

- o Pharmacists are used by older persons as sources of medical advice less frequently than younger persons, but when a relationship is established, the older people tend to be more "loyal" to a particular pharmacy (Gibbs, R03 AG03480).

- o Sleep disorders are known to be comparatively common among older persons seen in a general medical clinic, but they tend to be ignored in medical records and not to be treated (Coates, R03 AG04680).
- o Sleep disorders among older persons are more characteristic of those who spend time in solitary relaxation, whereas those who are active and more socially involved tend to sleep well (Coates, R03 AG04680).

The question of how people can be persuaded to engage in those preventive health practices associated with beneficial health outcomes has assumed great importance:

- o Preliminary research suggests that vivid case history materials are more effective than abstract scientific information in persuading older persons to engage in preventive health practices. The greater persuasive impact of case history material is most evident among those who express little personal concern about potential health threats. There is no evidence reported, however, of a differential impact on subjects' actual health behaviors (Rook, R03 AG04125).
- o A content analysis of health promotion brochures shows that conventional wisdom rather than scientific evidence is more frequently relied upon in the presentations (Rook, R03 AG04125).

A series of psychological studies is beginning to reveal important age-related differences in health and illness behaviors:

- o In defining illness, older persons tend to be less responsive to symptoms than younger persons. They are less likely to regard symptoms that are characteristic of declining physical vigor (such as aches or weaknesses) as useful predictors of illness. Duration of the symptoms does appear, however, to have a greater impact on older as compared to younger respondents (Levanthal, R01 AG03501).
- o Older people, who are less likely to show emotional responses to illness, are more apt to try to control their emotions than younger people (Leventhal, R01 AG03501).
- o Certain age-related differences in the practice of health and illness behaviors have been shown in one community study of healthy persons. People over 60 years of age report a slightly greater frequency of health behaviors than younger people; they are more likely to take vitamins, get enough sleep, avoid salty foods, make regular visits to their doctors, and avoid a variety of events that are seen to increase the risk of illness (Leventhal, R01 AG03501).
- o Studies of clinical populations show that older persons are more compliant than younger persons in following medically prescribed regimens, but are slightly less inclined to engage in specific recommendations that require life style changes (Leventhal, R01 AG03501).

o Emotionally induced side effects of cancer chemotherapy, such as drug-induced nausea and conditioned nausea, decrease in frequency with increased age of the patient. This finding reveals that older people can cope with intensive cancer treatments and actually have fewer adverse side effects than younger persons (Levanthal, R01 AG03501).

o There is little evidence for clustering among a wide range of health and illness behaviors, so that health promotion strategies targeted to any specific health behavior will not necessarily have general effects across the total complex of behaviors associated with morbidity and mortality (Leventhal, R01 AG03501).

Sociocultural studies are addressing how older people and their support systems define and manage chronic disabilities in the community:

o Ethnographic research reveals that urinary incontinence is largely undiagnosed and, consequently, untreated in the community. The primary strategies used to manage urinary incontinence involve keeping careful control of smell and of the fact of incontinence. Negative psychological consequences of this condition are minimized by treating it as a normal and expected part of old age (Mitteness, R01 AG03471).

o Research suggests that the stroke victim is extremely pivotal in defining the health crisis for himself as well as those around him. The attitudes of the stroke victim - either optimistic or pessimistic - affect caregivers' orientations toward the future and their consequent ability to care for the stroke victim during the rehabilitation process (Schulz, R01 AG04349).

One ongoing study emphasizes the strong influence of psychosocial factors on immune functioning in older people and thus challenges previous notions that it is the passage of time per se that affects immune response:

o Immunosuppression appears to be affected primarily by alterations in nutrition and health and by psychological stress that is perceived as uncontrollable and/or unavoidable (Rodin, R01 AG02455).

o While it might be hypothesized that stress has adverse effects on nutritional intake, recent data suggest that nutritional intake is relatively unaffected by stress (Rodin, R01 AG02455).

Longitudinal studies are beginning to examine women's work histories and retirement patterns:

o The careers of women physicians appear to have been influenced more by early life course experiences, such as parent-child relationships and medical school academic standing, and less by such later-life factors as marital status and family size (Pearson, R01 AG01760).

o Preliminary research suggests that women are more likely to continue working following their husbands' retirement than are husbands when their wives are retired (Haug, R01 AG03476).

An ongoing investigation of how women approach and experience the menopause seeks to understand how biological factors interact with psychosocial factors to affect the health and well-being of women in their middle years:

- o Contrary to popular belief, menopause is not universally associated with negative attitudes or physical symptomatology. While menopause is not generally characterized by depression, there is a slight, transient increase in depressive feelings during the perimenopausal period and a markedly higher prevalence among those with an artificial menopause. Women who undergo a hysterectomy, as compared with women undergoing natural menopause, tend to be of poorer health and more frequent users of health services prior to the surgery (McKinlay, R01 AG03111).

Overview of Program Plans, FY 1986-1989

Future plans for the SPA cluster involve continuation of ongoing grant activities and intensification of the initiatives in "Methodology of Longitudinal and Cohort Analysis" and "Behavioral Geriatrics Research."

Psychosocial Aging

FY 1986. Two lines of activity are contemplated for the coming year: the first is to follow up on the suggestions made at the September 1983 grantee workshop on work and retirement in order to integrate and communicate the considerable body of work now emerging on this topic. Participants at the workshop suggested the routine exchange of progress reports, news about new awards, joint sessions at professional society meetings, etc., as a means for developing and maintaining a network of BSR researchers on work and retirement. Moreover, some leads were provided for the direction of future research, and they will be converted into a revised program announcement on work and retirement. (The existing announcement was issued in 1978 and does not reflect the current programmatic emphases of BSR.)

The second line of activity involves an indepth study of the concept of subjective personal efficacy over the life course. A large number of studies by psychologists and sociologists has pointed to the individual's sense of personal control over his/her environment as an important contributor (either directly or indirectly) to psychological and physical well-being. Yet little is known about factors influencing sense of control and especially how sense of control may change as people age. Moreover, given that sense of control is multidimensional, there is even less known about aging trajectories and influences upon the various dimensions. Pending adequate staffing levels, a literature review will be undertaken in this area.

FY 1987-1989. Again, if staffing levels permit, a more active stance will be taken toward program development in the Psychosocial Aging Section. A first step will be to establish a group of ad hoc consultants to assist in the review of the section's grant portfolio and in the identification of promising directions. This step will be followed by publication of commissioned papers in appropriate social psychology journals and the issuance of one or more program announcements as a means of recruiting investigators to the program and stimulating needed research.

Biosocial Aging and Health

FY 1986. During 1986, staff in this section will give special attention to the rapidly developing program in "Behavioral Geriatrics Research," will define a new emphasis in relation to the NIA initiative on "Gender Effects on Health and Longevity," and will continue its several collaborative activities with colleagues in BSR, BRCM, and other NIH Institutes.

The development of behavioral geriatrics research, which was initially spurred by the broad program announcement on "Health and Effective Functioning" and which intersects other aspects of the BSR and BRCM programs, has been given special impetus by the issuance in 1984 of the two program announcements: "Health Behaviors and Aging: Behavioral Geriatrics Research I" and "Special Emphasis Research Career Award (SERCA) for Social and Behavioral Scientists in Behavioral Geriatrics Research." Two related activities are planned for FY 1986 to review and evaluate the progress in this area and provide consultation on future directions.

First, the establishment of an ad hoc task group of advisors that began in FY 1985 is planned to assist in the review of the section's grant portfolio and make recommendations for future research directions and priorities. This kind of consultation has been conducted earlier in the two other clusters, CBA and OPS, and has proved useful in helping to identify promising research areas and investigators.

Second, a national meeting is planned to provide interchange among current grantees and other experts. A review of research activity in BAH shows the emergence of a strong core of on-going research that will make such a meeting worthwhile and desirable. This meeting will focus on grant-supported and other research activities related to the general topic of how older people perceive and respond to chronic illness and disabilities; it will include an examination of self-care activities, illness cognitions, coping responses, and the rehabilitation process itself.

In conjunction with SPA and BSR as a whole, a new program announcement on "Gender Effects on Health and Longevity" is planned for 1986. This program announcement is responsive to the recommendations of high priority research needs made by the HHS Task Force on Women's Health and will include topics such as: How do biological factors interact with environmental and behavioral factors to produce the marked temporal and geographical variations in the size of the gender differentials in health and longevity? How do women and men differ in symptom recognition, assessment of symptom severity, readiness to take curative or preventive health actions, and tendency to report symptoms that actually exist? What changes are occuring in the patterns of exposure to hazards and in risk-taking behavior for women and men, and how much do these differences contribute to changing differences in mortality and morbidity?

How will women's health respond to the dual roles of homemaking and labor force participation or to the added role of caregiver to older persons who increasingly live entirely alone?

Two major activities reflect on-going collaboration with BRCM. Staff will continue to provide consultation on the behavioral science aspects of the clinical trials of behavioral treatment for urinary incontinence. Since these trials are funded through a cooperative agreement mechanism, program staff members are "co-equals" with outside research investigators. Recruitment and implementation of behavioral treatments will be major issues in the coming year. A variety of scientific presentations on the background and objectives of these trials are being planned for FY 1986.

Staff will also continue programmatic activities in developing and monitoring social science components of the Teaching Nursing Home Program. Mechanisms for increasing information exchange between sites are being considered. In addition to establishing an ongoing newsletter to report on work in progress and emergent findings, annual meetings of TNH principal investigators are being planned in conjunction with major professional meetings such as the Gerontological Society of America.

Another area of interest is the development and testing of sociobehavioral interventions for health maintenance and disease prevention across the life span. A staff member of BAH will continue to serve as project officer on a joint HCFA/NIA cooperative agreement on the "Prevention of Falls." As with the clinical trials in urinary incontinence, staff will be involved in the development, implementation, and evaluation of scientific protocols that test the cost-effectiveness of behavioral vs environmental interventions to reduce falls in frail older people. A request for applications on the development and modification of behavioral risk factors is planned for FY 1987.

The program announcement on "Social and Behavioral Aspects of Alzheimer Disease" will be issued in FY 1986 or FY 1987. This announcement will be responsive to the recommendations of high priority research needs made by the NIA Task Group on Families, Informal Supports and Alzheimer Disease.

Cognitive and Biopsychological Aging (CBA)

This cluster is concerned with the identification and specification of cognitive and perceptual changes and stabilities that, interacting with biological processes, occur with aging. Research is needed for: specifying conditions under which average patterns of aging are variable and potentially modifiable; seeking out universal changes with aging that persist across varied conditions; providing baselines for the diagnosis and therapy of pathological deficits in cognition and functioning; examining neuropsychological mechanisms that may be implicated in the aging of the immune or endocrine systems; supplying information for the design of roles and environments that can utilize the special strengths of middle-aged and older people and that can enhance their functioning; and setting appropriate employment and retirement policies.

Developmental Activities and Achievements, FY 1985

The activities of this cluster are conducted in the following two sections:

Cognitive Aging (CA). This section supports research and research training on constancy and change in the processes of sensation, perception, attention, memory, learning, cognition, intelligence, motivation, creativity, wisdom, and psychomotor performance, and in responses to technological change as individuals grow old. Widely observed social and temporal variability in performance suggests that biological, psychological, and social factors interact to produce age-related differences in levels of performance. Increasing understanding of these multifaceted influences can point to particular psychosocial, environmental, and technological interventions that may prevent, reverse, or compensate for many age-related declines in performance.

Biopsychological Aging. This section, which is only beginning to develop, supports research and training in the relationships between cognitive aging and neural and other physiological aspects of aging. It includes studies of genetic bases of behavior; animal models of behavioral aging; biofeedback; and neuropsychology of aging together with psychological components of neuroendocrinological and neuroimmunological aging. It complements BRCM in emphasizing cognitive and sensorimotor factors in geriatraic research (e.g., exercise, nutrition, falls, and Alzheimer disease).

The Grants Program

Research has demonstrated many age-related changes in sensation and perception (vision, hearing, taste, touch, smell) and psychomotor skills (e.g., reaction time, coordination, muscular strength). Further intensive study is needed of specific perceptual and neuropsychological and related cognitive processes that are affected by age and the implications of these processes for older people's productivity and effective functioning in everyday living. Among the activities for developing a program in cognitive aging, the most immediately productive continues to be a program announcement on "Visual Perception and Aging." Vision (later to be followed by hearing and human factors) was selected for special emphasis as the topic most nearly ready for fruitful development at this time.

Other developmental activities in FY 1985 included participation in scientific conventions, research conferences, and workshops. During the annual convention of the American Psychological Association, several NIA-supported grantees held symposia in areas such as visual aging and memory. These grantees were encouraged by CBA staff to prepare such symposia. The convention also offered an opportunity to foster research among psychologists not yet working on aging. Similar activities took place during the annual convention of the Gerontological Society of America.

In the spring, a CBA staff member participated in the George Talland Conference Series Conference on cognition in everyday life. The results of this conference will be published next year. These conferences, originally suggested by CBA, are partially supported by NIA. The results of last year's conference on clinical assessment of memory in older people were published in the summer of 1985.

Scientific Development

Liaison was maintained with various external programs. During the last year NIA encouraged the NAS Committee on Hearing, which NIA partially supports, to update the 1975 white paper on understanding speech and aging. Sufficient progress has occurred in the speech and hearing sciences to justify work on hearing. A working group of the committee has met twice, and a tutorial paper will be published in the Journal of the Accoustical Society of America, with summaries sent to clinically oriented journals. This paper was used by BSR as the basis of a program announcement on "Auditory Perception and Aging" released in FY 1985. The sister Committee on Vision at the NAS is also initiating projects at NIA's request. Currently, plans to carry out a study of vision and the aging worker are being developed. NIA also began partial support of the NAS Committee on Human Factors. It is being asked to prepare a paper identifying research in aging and human factors. In addition, CBA staff serves as NIA's representative on the Interagency Committee on Visual and Hearing Handicaps of the National Institute of Handicapped Research.

A major new area identified this past year is the initiative in "Intellectual Functioning, Social Structure, and Aging." Drawing on a number of recent speeches and articles, the initiative has been developed in successive workshops sponsored by the NIA with the Max-Planck Institute in Berlin. Building on the planning meeting held in Los Angeles in September 1983, a major workshop was held in September 1984 under the auspices of NIA to bring sociologists and life span psychologists together. The aim was to explore little-studied aspects of intellectual functioning that may develop as people grow older and as their experience accumulates. Small workshops had been held during 1984 to test the feasibility and appeal of this highly exploratory interdisciplinary enterprise. A book developing the papers from this workshop is in preparation.

In regard to resource development, CBA administered the Aging Nonhuman Primate Colonies through a co-funding agreement with the NIH Division of Research Resources. The colonies make aging Rhesus monkeys available to NIA grantees and others for research on aging. In order to facilitate coordination of the development of primate resources with the larger program on animal resources, the responsibility for managing the agreement was given to BRCM.

CBA also worked with the National Eye Institute (NEI) to issue a request for applications for grants on "Functional Assessment of Vision in Low Vision Patients"--the majority of whom are older people. Staff from this section also represented NIA on the NEI-NIA sponsored workshop on research opportunities in essential blepharospasm.

Research Highlights, FY 1985

Cognitive Aging

Two themes emphasized in the many CBA studies of intricate mechanisms involved in cognitive aging are 1) new understanding of everyday life in contrast to laboratory performance and 2) increasing specification of interventions that appear to be successful in reducing differences in performance traditionally thought to be determined by age.

Perceptual Aging

Taste and Smell

- Both age and nutritional status combine to affect preference for a nutritionally significant chemosensory stimulus such as soup (Murphy, R01 AG04085).
- Although chronic dysgeusia (bad taste in the mouth) may well be a problem for some older persons, particularly those with poor oral hygiene and fragile health, it does not appear to be a necessary consequence of normal aging (Murphy, R01 AG04085).
- Old age weakens perceived odor strength and nasal pungency, in contrast to a typical sparing of all but weak taste strengths. These odor losses occur for many, if not all, odorous compounds, including ethyl mercaptan--a natural-gas warning agent (Stevens, R01 AG04287).
- Olfactory losses with age tend to resemble conduction deafness, in which there is a constant loss over the loudness continuum, rather than recruitment deafness, in which there is loss of threshold sensitivity but normal loudness perception at higher levels (Stevens, R01 AG04287).
- Diabetics, and especially diabetic women, overestimate the relative magnitude of sweetness of sucrose solutions compared with age-matched nondiabetics (Perlmuter, R01 AG02300).

Vision

- The absorption of light at the blue end of the spectrum increases about twenty-five fold between birth and age seventy. This increase results from the well-known changes with age that occur in the coloration of the optics of the eye and can explain some of the changes in color vision in older people (Werner, R23 AG04058).
- Substantial individual differences in macular pigment density are found, but variation in density is not systematically related to age between 10 years and 90 years. This pigment has a protective role that minimizes overexposure to potentially damaging radiation (Werner, R23 AG04058).

- Age-related deficits in neural processing of rapidly changing visual stimuli result in poorer quality of sensory information, hence poorer performance on tasks involving spatial-relations abilities (Royer, R01 AG03178).

- There is a pattern of increased age differences in contrast sensitivity functions as the target is made more "transient," i.e, linear spatial frequency, faster motion (Kline, K04 AG00019).

- The psychophysical method of increasing contrast yields more reliable and stable contrast sensitivity functions than the prevalent Bekesy tracking method (Gilmore, R01 AG03209).

- Older observers have attenuated light increment thresholds to flashed backgrounds (Sturr, R01 AG04465).

- It is widely reported that younger people identify large letters faster than small letters. In contrast, older people do not show such an effect. This global form processing deficit in older people is due to their lower sensitivity to the critical band of spatial frequencies necessary for speeded identification of large letters (Gilmore, R01 AG03209).

- Compared to respondents below 50 years of age, older ones report significantly more difficulty reading a street sign when there are many other signs around. This difficulty is related to the laboratory observation that older observers have far greater difficulty than young observers in recognizing a brief target presented in the midst of other targets. Thus the two domains--everyday visual function and laboratory assessments of vision--are linked (Sekular, R01 AG01251).

- Age-related deficits in iconic (visual) memory capacity reside with early sensory effects, such as retinal illumination and spatial frequency sensitivity, rather than more central processes, such as attention switching that is necessary for read-out from iconic memory (Gilmore, R01 AG03209).

- In performing a detection task older people process smaller "chunks" of visual information than do younger people. Nevertheless, within this capacity-limit of older persons, both age groups are equally affected by the Gestalt perceptual organization principle of grouping by good continuation (Gilmore, R01 AG03209).

- Systematic practice with visual stimuli improves the visual acuity of older observers and may also transfer to other acuity-related tasks (Ball, R23 AG03888).

Hearing

- A sample of older individuals with a mean age of 76 years reports that hearing loss (audiometrically determined) makes them feel handicapped, irritable, frustrated, nervous, and upset and that it interferes with their understanding of friends, relatives, neighbors, television, and radio. The proportion of individuals experiencing those difficulties increases with the severity of the hearing loss (Weinstein, R03 AG03992).

Cognitive Aging

Attention

- There seems to be no age-related loss in the ability to use "top-down" or observer-generated information about where to place attention in visual cognitive tasks, and it is likely that even age-related increases in the time necessary to process "bottom-up" or environmentally-driven information can be attenuated by practice and experience (Hoyer, R01 AG02713).
- Older adults compensate for proneness to distraction or noise by giving more attention to the signal itself or to highly informative cues in complex visual cognitive tasks (Hoyer, R01 AG02713).
- Age-related deficits in complex visual search are due not only to deficits in information processing speed, but also to an age-related decline in the capacity to simultaneously attend to more than one task (Madden, R01 AG02163).
- Vasopressin and related peptides may facilitate cognitive performance in older people by inducing an increase in the allocation of attention to the task at hand (Jennings, R01 AG03792).

Episodic Memory

- Memory as assessed by either semantic or episodic priming, in which identification of a given word is facilitated by prior exposure to a related word, is uncorrelated with recall and recognition accuracy, suggesting that priming taps a different component of memory than more traditional measures and one that is less susceptible to the effects of aging (Howard, R01 AG02751).
- With only moderate study of sentences, young and older people show equivalent priming, even though older individuals are much poorer than younger ones on recognition and recall memory for the same sentences. Thus, older people must have stored away the associations among the words in the sentences even though this memory is not revealed by traditional measures (Howard, R01 AG02751).
- Although an age-related decrement in memory performance is evident in some tasks, this decrement is not necessarily accompanied by substantial changes in the way older individuals are encoding, at initial presentation, the items to be remembered (Madden, R01 AG03072).

- Older adults show substantial memory decrements for color relative to young adults, suggesting that color coding of pills, routes in hospitals, etc., may not be a particularly effective device in orientating older adults (Park, R01 AG02598).

- Although older persons perform more slowly than younger persons while searching their memory for recently learned spatial scenes, they perform as well as the younger persons when the arrangement of the scenes permits automatic rather than effortful processing (Puglisi, R03 AG03943).

- Well-functioning normal older women regularly report mentation upon experimental awakenings from different stages of sleep. The subjects, however, show less visual imagery than younger subjects, suggesting visual-spatial processing changes even in highly functioning older adults (Fein, R01 AG03334).

Semantic Memory

- When sentences are studied, older people appear to be less sensitive to the underlying idea structure of the sentence than young adults (Howard, R01 AG02751).

- Even though the ability to use linguistic context to specify meaning of words is unaffected in the healthy elderly, older adults consistently show poorer performance on tests of memory for these words (Burke, R01 AG02452).

- There are age-related deficits when young and older adults are asked explicitly to recognize words they have seen before, but no age difference when the task does not require conscious recollection, i.e., when the subject was not asked to remember but rather simply to perform a task in which the effect of prior experience could be manifested (Light, R01 AG02452).

- It is not merely the presence of intervening material that adversely affects comprehension of spoken discourse in older adults but rather the nature of the intervening material that is crucial. Shifts of topic produce a greater problem for old than for young adults (Light, R01 AG02452).

- Although older adults are at least as successful as the young in producing definitions in response to words, they are significantly less successful than younger adults in producing words in response to definitions. However, the word retrieval in normal older adults can be significantly improved by providing semantically related contextual cues and significantly worsened by semantically unrelated cues (Bowles, R23 AG03315).

Memory for Discourse

- The ability to recall from memory the information extracted from a discourse depends upon multiple factors indexed by measures that themselves are composites of more basic abilities. Differences in measures of lexical and semantic access, comprehension and vocabulary, reading rate, and age significantly predict degree of memory for written discourse (Hartley, R01 AG03362).

- Form of a text, expository or narrative, does not influence age differences in memory for the text. Topic familiarity, however, is an important determinant of discourse memory, and more so for older subjects than for younger subjects (Hartley, R01 AG03362).

- High scorers on prose recall tasks, whether young or old, are highly practiced at reading, take an analytical approach to the reading, and are sensitive to the organizational properties of the text (Meyer, R01 AG03438).

- Although older people may read more slowly than younger adults, they approach what they read in a way that is similar to what younger people do (Zelinski, R01 AG04114).

- Age-related inefficiencies in remembering written prose are due to current or past levels of environmental demands on memory performance that influence the use of strategies in remembering the material read (Siple, R01 AG04081).

- When advanced organizers are used to provide a framework for introducing more detailed information in a main passage that follows, the benefits of such organizers differ between younger and older individuals according to the type of memory for reading being tested and ability levels (Thompson, R03 AG04437).

- Recall for spoken discourse decreases with increasing speech rates to a greater degree in healthy older adults than in young subjects matched for general verbal ability. Within these limits older people effectively use linguistic information to help overcome the ordinarily debilitating effects of rapid speech input in a manner similar to young subjects (Wingfield, R01 AG04517).

Problem Solving

- The nature of the age differences observed in visual concept learning is dependent upon the cognitive requirements of the task and the nature of the task studied. Age deficits are large and apparently related to "effortful" memory skills, when subjects have to learn an explicit, rule-based concept using problem-solving techniques. In contrast, age deficits are minimal and memory skills are unrelated to performance when subjects make no explicit attempt to learn a concept implicit in environmental regularities. Both young and old adults spontaneously organize automatically encoded information in the form of a mental representation of environmental regularities (the prototype). Even though young adults have more distinctive memories of acquisition stimuli than older adults, both age groups classify new examples in terms of their similiarity to the prototype (Hess, R23 AG03566).

- The capacity of working memory is a critical determinant of performance on paper and pencil tests of problem solving, accounting for a significant proportion of age deficits as well as individual differences within age groups. In contrast, educational attainment and experience with games and puzzles were stronger predictors of performance on solving dilemmas and puzzles (Hartley, R01 AG01073).

Intellectual Aging

- Perceptual speed, numerical facility, and verbal comprehension show accelerating losses over seven years in successively older cohorts ranging in age from 51 to 89 years. The rates of these increasing losses depend on the ability being measured--greatest for perceptual speed and least for verbal comprehension (Cunningham, R01 AG04337).

- Longitudinal declines in the performance of subjects above the age of 60 on the primary abilities of "spatial orientation" and "inductive reasoning" are due primarily to decreases in the number of items attempted. Furthermore, when the decline in attempted items is taken into consideration, the decreases are due to decreases in accuracy, i.e., subjects answered fewer items correctly and committed more commission errors (Schaie, R01 AG03544).

- The beneficial effects of cognitive training on performance on tests of spatial orientation and inductive reasoning abilities are due to increases in accuracy, as reflected by an increase in correct responses and a decrease in commission errors (Schaie, R01 AG03544).

Psychometric Aging

- Performance of older adults under time pressure increases substantially when rewards and penalities depend on responses meeting specified time limits. These operant training procedures bring the performance of older persons into the ranges ordinarily seen in younger control subjects. Such procedures appreciably reduce age differences usually seen at the start of the experiments for simple response tasks but not for more complex tasks, such as discrimination learning, memory, transfer, and directed attention. These residual age differences do not seem to be due to cautiousness or other motivational variables (Baron, R01 AG02513).

Biopsychological Aging

Biocognitive Aging

- Older persons lacking the P-300--an event-related brain potential that is well-established as a measure of the nature and speed of information processing--are slower to search working memory, particularly when processing a novel stimulus. However, when they have to recognize a previously presented stimulus, they do as well as do subjects who display the P-300 (Donchin, R01 AG03151).

- Older subjects (62-75 years), who are in good health, have at least a high school education, and are enrolled in university programs perform well within the normal range in the Luria-Nebraska Battery--a widely-used instrument that identifies CNS deficits. Differences in performance from young adults are small or nonexistent (Baron, R01 AG02513).

- The deteriorative course of SDAT does not follow a "general pattern." Rather than being reflective of subtypes of the disease, the observed heterogeneity seems to reflect components related to memory, language, and motor control, which are free to combine together in a relatively unconstructed manner, and which predict age of onset and morbidity (Schwartz, R01 AG02231).

- Difficulties in marketing and handling finances are early signs of primary degenerative dementia (Reisberg, R01 AG03051).

- Although demented patients are greatly inferior to normal subjects in episodic-memory tests, they perform equally well on the semantic-memory tasks. Therefore, the structure of semantic associations is still present in demented subjects even though they have difficulty voluntarily accessing this material (Nebes, R03 AG04013).

- Peripheral slowing is one differentiating factor in the comparison of information processing abilities among subjects with mild forms of dementia and normal subjects. In general, qualitative patterns of information processing are present at the beginning stages of dementia. However, subtle but reliable deficits in the ability to maintain an attentional set, semantic processing, and decision processes differentiate groups of patients that vary in the distribution of pathology in cortical and noncortical areas of the brain. These groups of patients included those with Parkinson's disease, Alzheimer disease, and progressive supranuclear palsy (Poon, R01 AG03354).

- Perhaps the best measure of bradyphrenia--a lowering of intellectual functioning--in Parkinson's disease is a measurement of reaction time and vigilance. These aspects of intellectual dysfunction may in turn be related to altered norepinephrine metabolism (Mayeux, R01 AG02802).

- While middle-aged subjects with normal blood pressure improved over 5 years on the WAIS verbal scores but not on performance scores, middle-aged subjects with essential hypertension stayed the same on both measures of cognitive performance (Elias, R01 AG03055).

Animal Models

- Social housing of rats throughout life has selective behavioral and biological effects in that locomotor activity, lean body weight, and longevity are enhanced whereas reaction times and associated operant responding, which show no age-related changes across the life span, are unaffected (Baron, R01 AG02513).

- Longitudinal analysis of dominance, aggression, and social relations of stable groups of rats up to 500 days of age indicates that, compared to females within these groups, who engaged in little aggression, male colony members exhibited high levels of intense daily fighting among themselves throughout life. This finding stands in marked contrast to current theoretical conceptions that aggression should decline during adulthood in relation to decreasing reproductive potential with age (Blanchard, R01 AG03060).

- In contrast to the life-time invariance of the affective state underlying aggression in rats, a pronounced reduction in fear and defensive behavior occurs with advancing age (Blanchard, R01 AG03060).

- Senescence-related immune factors, as manifested in the formation of brain-reactive antibodies, are correlated with dysfunctions of learning and memory in inbred mice and perhaps underly neurodegenerative changes with aging (Lal, R03 AG03623).

- Undernutrition, presumably because of the accompanying decrease in body weight, initially improves performance of rats on measures of motor strength, coordination, and sensorimotor reactivity. However, once the initial advantage of the reduced body weight is achieved, the rate of decline with advancing age seems strikingly comparable to that of the free-feeding rats. The visual system, in contrast, exhibits a wide divergence between undernourished and control animals. Undernourishment seems to have accelerated the loss of visual sensitivity associated with aging (Campbell, R01 AG02447).

Overview of Program Plans, FY 1986-1989

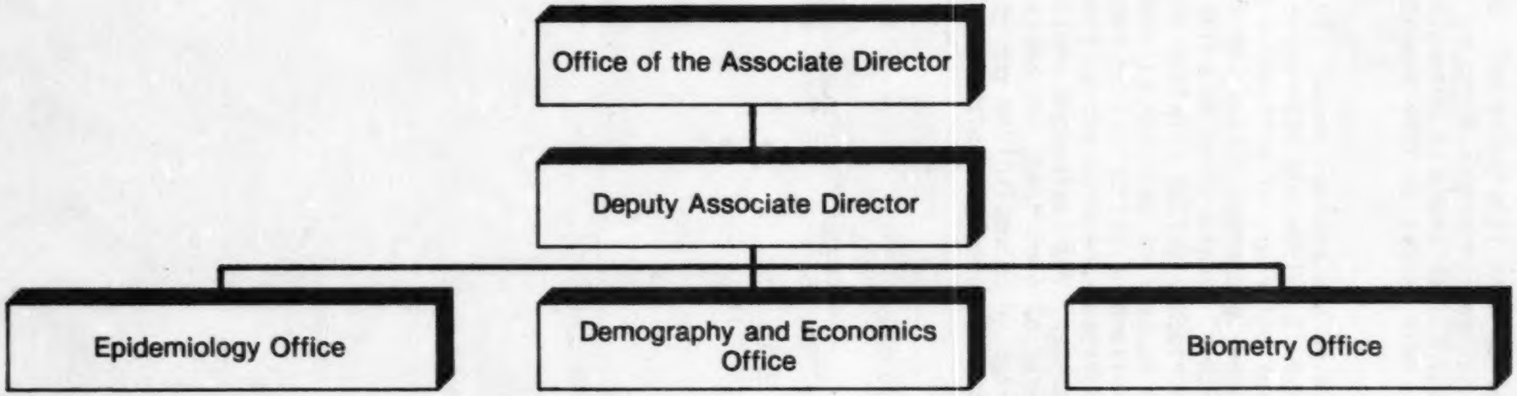
A program announcement, "Speech Understanding and Aging," is being developed for release in 1986. Modeled on the BSR program announcement on "Aging and Visual Perception," it will incorporate the recommendations of the NAS Committee on Hearing concerning aging and understanding speech. Audition is an area of research that is generally neglected even though it is an important area.

Another 1986 program announcement in "Cognitive and Intellectual Aging" is being developed for release. Stimulated by discussions during several workshops on cognitive aging that have been held during the last year, including the George Talland Memorial Conference Series on cognition in everyday life and the program review of CBA, the program announcement will attempt to foster research on aspects of the rapidly emerging cognitive sciences that are relevant to aging. Areas of special concern will be the role of experience, age-related changes and constancies in successful cognitive aging in everyday life, and discovering and measuring new dimensions of intellectual functioning in middle and old age.

A variety of planning activities is proposed in order to review and evaluate the biopsychological component of CBA. A small group of biopsychologists and gerontologists will work with CBA to identify areas that are relevant to aging and ready for exploitation. The panel will help to identify outstanding biopsychologists who could become NIA grantees and/or participate in a workshop on biopsychological aging intended for FY 1987. Following the workshop, a program announcement will be issued that defines a research agenda for biopsychological aging.

Another program announcement, "Human Factors and Aging," will be developed and released in 1987. System design and the world of work are undergoing profound changes. In a period when automation is replacing the need for finely tuned perceptual-motor activities by skilled operators, human productivity is no longer easily assessed in terms of unit output. New systems place increased demands on the cognitive and decision-making aspects of human performance. The role of people in systems is shifting to that of monitoring and directing otherwise automatic processes in industrial production, transportation, and office work. A recent report by the National Research Council (NRC) on research needs in human factors emphasizes the importance of understanding fundamental cognitive processes and their role in interactive and supervisory control systems and how they may be influenced by aging. The program announcement will be based on forthcoming recommendations of the NRC's Committee on Human Factors.

Epidemiology, Demography, and Biometry Program


Office of the Associate Director
Deputy Associate Director
Epidemiology Office
Demography and Economics Office
Biometry Office

7/1/84

EPIDEMIOLOGY, DEMOGRAPHY, AND BIOMETRY (EDB) PROGRAM

This program (1) plans, conducts, and directs epidemiology, demography, and biometry programs relevant to the mission of the National Institute on Aging; (2) collects and analyzes data regarding the distribution of older people by such categories as sex, race, and socioeconomic and demographic characteristics and serves as a focal point for these data; (3) plans, initiates, coordinates, and analyzes national and international epidemiologic longitudinal studies and studies of special populations; (4) in collaboration with NIA staff and staff of other institutes, Federal agencies, and scientific organizations, recommends priorities and develops epidemiologic studies of specific diseases and conditions affecting older people; (5) provides consultation and service to NIH program areas and private organizations on epidemiology, demography, and biometry studies on aging; (6) recommends mechanisms to be used or develops mechanisms to accomplish program objectives; and (7) plans and directs contractual and collaborative research and training in the areas of epidemiology, demography, and biometry research.

Selected Program Activities in FY 1985 and Plans for FY 1986

Since 1978 the EDB program has progressed from initially recognizing the lack of population estimates of prevalence and incidence of health problems and impairments of older people to meeting this deficiency by initiating several population studies of older people. These studies have now been established and are accumulating valuable prospective data. The direction and efforts of the EDB program must now turn to the analysis of this vast amount of data to provide much needed information on the leading health problems of older adults. These analyses should identify associated factors for further investigation and generate hypotheses to define the actual risk factors of developing the health problems. The ultimate goals of this research are the transfer of knowledge for the implementation of prevention programs and the provision of solutions for maintaining persons at their optimal ability for independent living and life satisfaction in the later years.

While the staff has turned its attention to analyses of the accumulated data, effort has also been focused on continued data collection in the program's major research projects, the four Established Populations for Epidemiologic Studies of the Elderly (EPESE), the National Health and Nutrition Examination Survey (NHANES I) Epidemiologic Followup Survey, the Survey of the Last Days of Life, the various aspects of the Framingham Study, and initiation of several new projects.

EDB staff has also used data from other national data sets, primarily integrating the data into ongoing EDB research. In particular, the macroeconomic demographic model (MDM) has coordinated data from the National Center for Health Statistics (NCHS), the Health Care Financing Administration (HCFA), the Social Security Administration (SSA), and the National Center for Health Services Research (NCHSR). Types of health expenditures and sources of funding have been studied by age and sex. A project on Household Formation, Housing, and Aging Population was initiated to study the rapidly changing patterns of household formation and housing tenure among older people. Another study on "Aging, Health and Consumer Expenditures" was extended this year for the purpose of re-estimating data that underly the consumer expenditures model. Simultaneously, a contract on "Health Expenditures and Aging Population" was extended to permit the estimation of the health expenditures model in conjunction with the consumer expenditures model. Research on microeconomics is now being developed and will focus on studies of wealth. Work has already begun on the wealth-age profile, including rights to private pensions and social security.

EDB staff has published several papers from the ongoing studies, including an important paper in the American Journal of Public Health, on the incidence of hip fractures by age, sex, and race. Another paper is being prepared on the occurrence of digitalis use among EPESE subjects, and papers on self-assessment of hearing vs. pure tone audiometry, the relationship between sleep problems and dementia, the relationship of hearing ability and bone density, and correlates, predictors, and prognostic significance of varicose veins in later life are being developed from the NHANES I Followup data.

A paper on methodologic issues and preliminary findings from a study on the epidemiology of disability in the oldest old was published in the Milbank Quarterly. This publication was developed through collaboration among the investigators at the three original EPESE locations and EDB staff.

Plans are being developed for research aimed specifically at the oldest old participants at all four EPESE sites. These plans include indepth studies of nursing home admissions and clinical evaluation of specific health problems.

Plans for collaborative work are being developed with the United Kingdom to collect statistics comparable to those in the EPESE studies. In addition, ties have been established with Japan that may lead to comparative studies related to dementia. There are also possibilities for collaborative work with Sweden and Italy. Such projects could provide not only comparison of prevalence and incidence data but a test of replication of identified associated factors.

Epidemiology Office

This office conducts intramural and contract-supported research. (1) It plans and conducts disease-oriented epidemiologic studies on conditions such as the senile dementias, hip fracture, sleep disorders, etc. (2) It plans and conducts population-based descriptive and hypothesis-testing studies to define the natural history of health and disease, including the broad understanding of the effects of nutrition, natural history of disabilities, nursing home use, and the past and present health outcomes considering health status and economic and social factors. (3) It supervises and trains research investigators in epidemiologic methods, study design, and analysis. (4) It collaborates with investigators in the other offices of the EDB program, in intramural and extramural programs of the NIA, in other Government agencies, and in the private sector.

Developmental Activities and Achievements, FY 1985

A number of meetings to develop and exploit the research potentials of the four EPESE projects were held both in Bethesda and Chicago and in conjunction with meetings of the American Statistical Association in Philadelphia and the American Public Health Association in Anaheim. These meetings were focused on conjoint analysis of specific data, planning for continuation of the interval of surveillance for an additional 3 years at the original three EPESE sites, resolution of methodologic issues, and review of proposed analyses and reports.

It was decided that the core analyses must be undertaken in a systematic and coordinated fashion to be certain that they are promptly and appropriately published. The definitions and assignments for these analytic tasks were completed during FY 1985. They included fundamental descriptive and analytic studies concerning mortality, hospitalization, nursing home admission, and physical and cognitive disabilities.

Excellent progress was made at all three of the primary EPESE sites with regard to collection and coding of mortality data; acquisition and coding of hospitalization data using HCFA tapes; identification of nursing home events; continued participation of subjects through a second telephone contact and into the second cycle of household interviews; and comparable coding of prescription drugs identified during the household interview. Substudies on a diversity of topics continued to be carried out at each site. The process of registering and interviewing "new" participants who have become 65 since the study began (i.e., the successive cohort component of the East Boston study) progressed well. Information concerning nursing home events that has accrued at each site is especially interesting and promises to provide unexpected insights into this aspect of health care.

The fourth EPESE, in a predominantly black population in North Carolina, got under way this year with development and pretesting of interview instruments, further definition of the target population, and completion of OMB clearance tasks.

The following papers, published in FY 1985, resulted from research at the EPESE centers:

Branch, L.G., Scherr, P.A., Cook, N.R., and Taylor, J.O.: Functional status and service use among a community sample of elderly veterans. In: Wetle, T, and Rowe, J.W. (Eds.): Older Veterans: Linking VA and Community Resources. Cambridge, Harvard University Press, 1984, pp. 26-320.

Lavsky-Shulan, M., Wallace, R.B., Kohout, F.J., Lemke, J.H., Morris, M.C., and Smith, I.M.: Prevalence and functional correlates of low back pain in the elderly: The Iowa 65+ Rural Health Study. J Am Geriatr Soc. 33(1)23-28, 1985.

Loening-Baucke, V. and Anuras, S.: Effects of age and sex on anorectal manometry. Am J Gastroenterology. 80(1)50-53, 1985.

Mobily, K.E., Leslie, D.K., Wallace, R.B., Lemke, J.H., Kohout, F.J., and Morris, M.C.: Factors associated with the aging leisure repertoire: The Iowa 65+ Rural Health Study. J Leisure Research. 16(4)338-43, 1984.

Wallace, R.B.: Drug utilization in the rural elderly: Perspectives from a population study. In: Moore, S.R. and Teal, T.W. (Eds.): Geriatric Drug Use--Clinical & Social Perspectives. New York, Pergamon Press, 1985, pp. 79-85.

Wallace, R.B., Lemke, J.H., Morris, M.C., Goodenberger, M., Kohout, F., and Hinrichs, J.V.: Relationship of free-recall memory to hypertension in the elderly. The Iowa 65+ Rural Health Study. J Chron Dis. 38(6)475-81, 1985.

During the past year the final data tapes from the NHANES I Epidemiologic Followup Survey became available. Several committees with representation from all of the involved institutions met to discuss specific analyses, several of which are now being carried out. EDB staff are guiding or are involved in analyses related to mortality, hypertension, disability, weight, cognitive functioning, arthritis, hearing, sleep complaints, and other subjects.

Plans were initiated to publish a book that will summarize findings from the NHANES I Epidemiologic Followup Survey. This book will provide new information on the epidemiology of problems of aging and will inform the scientific community about the contents of the data set in order to facilitate its use by other investigators. A workshop was held in September 1985 for all of the authors to present the anticipated contents of their respective chapters. Small group discussions were arranged for those authors whose chapters appeared to overlap in content. Several more workshops are planned for FY 1986, and a conference is planned for the end of the year when the book will be presented to the public.

Dementing diseases continued to be a major focus of activity during FY 1985. The study in East Boston on the Natural History of Senile Dementia produced rather startling results. Based on the approximately 500 subjects examined as part of the study, the prevalence of moderate to severe cognitive impairment in the noninstitutionalized East Boston population over 65 is substantially higher than has been reported in other studies. In addition, approximately 80 percent of the persons identified as suffering from moderate or severe cognitive impairment were also identified as having Alzheimer disease, either definite or probable, based on their clinical evaluation. Overall, these data suggest that rates of Alzheimer disease are substantially higher than expected among East Boston's elderly. Further analyses of these data are currently under way and are expected to result in the generation of manuscripts for publication early in FY 1986.

The Framingham Dementia Study is now entering a phase when analyses related to the clinical diagnosis of dementia are becoming possible. An initial examination of the performance of study participants on a dementia screening test was presented at a national neurology meeting in Texas. In March, the involved investigators from Boston University, the National Heart, Lung, and

Blood Institute (NHLBI), and NIA met in Bethesda to review progress to date and to plan the course of future investigations. A specific series of tasks and investigative goals were defined.

In addition to a methodologic paper in press in the Journal of Chronic Diseases, three other analyses of data from the Framingham Study neared completion: a presentation of neuropsychological test data from cycle 14/15; a related paper that focuses on the relative effects of education and age and uses a composite score based on the eight tests given in cycle 14/15; and a manuscript relating concurrent and prior blood pressures with level of cognitive functioning at cycles 14 and 15. This latter paper is especially important in that it fails to confirm an association between elevated blood pressure and poor cognitive functioning.

In October 1984, an EDB staff member was invited to a meeting in Tokyo to encourage and facilitate collaborative and cooperative studies on aging between the United States and Japan. Meetings were held with a number of prominent Japanese scientists involved in studies on dementia. Contact was also made with representatives of the Tokyo Metropolitan Institute of Gerontology, an institution with which the NIA has established an agreement for reciprocal scientific activities. International epidemiologic research on dementia was also discussed on this trip. The possibility of NIA support for comparative studies among Japanese subjects residing in the continental United States, Japan, and Hawaii is currently being explored, with NIA extramural staff members playing a prominent role.

During FY 1985, a Public Health Service (PHS) Epidemiology Trainee on the EDB staff completed his formal training at the School of Public Health in Berkeley, California. His doctoral thesis involves the predictors of disability, poor health, and good health in the Alameda County Study population. Plans were made to extend these efforts to similar studies using the data sets available in the EDB program. The studies will result in publications comparing the predictors of both ill health and good health in several different populations.

Another study that defined the occurrence and correlates of digitalis use among EPESE subjects resulted in a manuscript currently in preparation. Results will be presented at the meeting of the American Public Health Association (APHA) in November 1985.

A study based on NHANES I data concerning to hearing (pure-tone audiometry and self-assessment of hearing) was carried out to examine the sensitivity and specificity of self-assessment. These investigations, directed by a scientist on detail from the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS), are of interest because they present data related to pure-tone hearing thresholds by age, sex, education, and degree of self-perceived hearing impairment.

Research Highlights, FY 1985

- o Analysis of a national data base demonstrates that the risk for hip fracture increases with age at the same rate (risk doubling time) in white women, black women, white men, and black men. However, for white women the age of onset of risk occurs about 5 years earlier than for the other three groups.

- Analysis of the trajectory of increasing age-specific hip fracture incidence fails to show an inflection at or following the usual age at menopause; this challenges the common assumptions related to a major role for menopause in fracture susceptibility.
- An association of hypertension with poor performance on a concurrently administered test of memory was demonstrated in the Iowa EPESE population in an analysis performed by EPESE contractors.
- A search for associations between performance on eight tests of cognitive functioning and concurrent or prior level of blood pressure in the Framingham Heart Study cohort has thus far been negative, failing to support the hypothesis that elevated blood pressure is a potent determinant of declining cognition in later life (manuscript in preparation).
- A preliminary analysis of the predictive utility of information on dietary calcium and anthropometric values for subsequent hip fracture in women has demonstrated no association with diet, but a substantial protective role for higher skinfold thickness and also for a calculated estimate of arm muscle area; these data contribute to an evolving appreciation of the complexities involved in susceptibility to fracture in later life.
- Comparison of performance on a screening test for dementia and scores on tests of cognitive functioning has demonstrated a strong association between these two evaluations. Levels of performance on the prior battery of tests have also been shown to predict survival at all levels of performance, even when controlled for education and age.
- A preliminary search for correlates of dementia among Framingham Heart Study subjects who have died, but whose records strongly suggested the existence of an organic dementia (compared with other participants who died in the same interval without evidence of dementia), failed to demonstrate any significant association with arrhythmia, electrocardiographic abnormalities, or a large number of other premorbid characteristics. The most suggestive association of dementia was with fundascopic observations several years earlier. This study is still in progress.
- Physical disability is significantly associated with depression symptoms. Findings from the New Haven EPESE project showed an association with every item on the CES-D Scale, not just with the somatically oriented items.
- A comparison of sleep complaints among participants at the three original EPESE sites showed quite similar rates and correlates, as well as a modest increase in complaints with advancing age.
- Analysis of patterns and correlates of digitalis use among participants in the first three EPESE projects demonstrated high prevalence rates (2 to 25 percent), which increased with age, and only minor differences between

centers or sexes. A substantial proportion reported having used the drug for more than 5 years. A history of heart attack and concurrent complaints of dyspnea were common but not always present; such associations were most common among the younger participants. These studies define the magnitude of the adverse drug effects problem and will help to assess the public health costs and benefits of current prescribing practices.

- Identification of hearing impairment by use of the Galudet self-assessment instrument has been evaluated by comparison with the results of pure tone audiometry; sensitivity and specificity were acceptable, with modest influence by sex, age, and education. These same data are being used to examine distributions and correlates of hearing ability.

- Scores on a brief mental status examination administered to approximately 10,000 older participants at the original three EPESE locations have been examined; substantial variation between score distributions at the three sites could be only partially explained by age and education differences, with poor performance and worse performance being most evident in East Boston and least evident in the Iowa population; these findings will be clarified as longitudinal data accrue.

- Studies of dementia in the East Boston population continue to support a higher than expected prevalence for Alzheimer disease. Vascular dementia seems to account for only 10 to 20 percent of the dementing illness. Almost none of the identified cases had been previously recognized as suffering from dementia. Patterns of progression will be examined as the study continues.

Overview of Program Plans, FY 1986-1989

FY 1986. During the coming fiscal year the major goals and activities of this office will focus on the continuation of the current population studies (EPESE, NHANES I Followup, and the Framingham Dementia Study), and the exploitation of these data sources through a series of analyses. Incomplete data will also become available for analysis in FY 1986 from the Natural History of Senile Dementia Study and from the Honolulu Heart Autopsy Study (a neuropathologic/epidemiologic study to identify predictors of neurofibrillary tangle development). The Epidemiology Office also expects to assist in analysis of data generated by the Biometry Office's Survey of the Last Days of Life.

Activities designed to provide future sources of information for analysis include the extension of the surveillance period for EPESE subjects, the supplementation of the EPESE protocols with special studies aimed at in-depth investigation of the "oldest old," continuing mortality and annual telephone surveillance of older NHANES I Followup subjects, and elaboration of the existing inter-Institute agreement with NHLBI for the study of dementia in Framingham Heart Study participants.

Cooperative agreements are being planned with investigators in the United Kingdom, Japan, and the United States; these agreements, if funded, will be directed by extramural project officers, with EDB staff providing scientific assistance and advice related to conjoint planning and analysis.

Fy 1987. The Epidemiology Office will continue its analysis of data from maturing contracts. As staffing levels permit, this office will begin to initiate a "new" series of studies in 1987 with major focus on secular, cross-cultural, and cross-national studies on the occurrence and predictors of (1) superior health and longevity; (2) age-related specific sensory impairments (sight, hearing, smell, taction, gustation) in relation to cognitive and motor disabilities; (3) cognitive impairment and dementia; (4) predictors and determinants of hip fracture; and (5) development of automated and other methods to detect early dementia.

FY 1988-1989. During these years several projects will have fulfilled many of their original intents, and the data tapes will be prepared for release to the general public. The documentation and presentation of these tapes, to be accomplished under contract, will require a considerable amount of staff direction.

The fourth EPESE will be maturing, and analyses of these data with Duke University investigators will be a major focus of activity.

A 5- to 6-year prospective study of 300 to 500 healthy, nondemented older persons in the Framingham population will be undertaken to identify preclinical evidence of Alzheimer disease. This study would utilize the most promising methods for detecting the disease process prior to the appearance of cortical disease and overt dementia.

Demography and Economics Office

The Demography and Economics Office conducts intramural and contract-supported research on the biomedical, biobehavioral, and economic phenomena involved in population and individual aging and health. (1) This office is the national focal point for investigating past, present, and future population trends in older peoplethat address the complex issues of sex, race, and geographic differences on observed and predicted patterns. (2) It plans and conducts research on how the behavior and productivity of the U.S. economy responds to population aging and investigates the interactions of per capita national income, private and public pensions, government transfers, the health and functional ability of older people, the ability and propensity to work, and the provision of general and long-term health care as they contribute to older people's standard of living, sense of well-being, and health. (3) It supervises and trains research investigators in demographic and economic methods and study designs and analysis. (4) It collaborates with investigators in the other offices of the EDB program, in intramural and extramural programs of the NIA, in other Government agencies, and in the private sector.

Developmental Activities and Achievements, FY 1985

During FY 1985 the Demography and Economics Office emphasized work in population aging with the continued development of the Macroeconomic-

Demographic Model (MDM). This model focuses on the current and future trend of the population whose mean age is rising or is made up of an increasing proportion of older individuals. The research is closely associated with the concept of demographic transition to a stable and older population structure. Staff also began to focus on the aged population per se through wealth studies, NHANES studies, and a new project on the microeconomics of aging that examines the health expenditures and health status of the elderly.

A major enhancement to the MDM continued under a contract to develop data on Health Expenditures and the Aging Population. This project required briefings and coordination with such agencies as HCFA, SSA, Department of Health and Human Services Assistant Secretary for Planning and Evaluation (DHHS/ASPE), NCHS, and NCHSR in order to avoid duplication and waste. Analysis of these data was started with the generation of numerous age-sex-expenditure breakdowns for type of health expenditures and source of funding. A paper on this work was presented at the International Health Economics and Management Association in Rome, Italy.

Because the recent revision of the National Health Accounts made the MDM's data obsolete, the contract was extended for one year to allow revisions in the model's data base. A paper was written by the investigators to compare National Health Account payments to their counterparts in the National Medical Care Utilization and Expenditures Survey (NMCUES).

A contract on Household Formation, Housing, and and Aging Population was awarded in FY 1985 to investigate the rapidly changing patterns of household formation and housing tenure among older people.

The contract on Aging, Health and Consumer Expenditures was also extended for one year along with the health expenditures modeling contract. The purpose of this research is to disaggregate consumption by age in the MDM so that the effects of the aging population may be examined with particular attention to the aggregate share going to health care services. The effects of public policy on the welfare of older people will be examined, using the latest cost-benefit techniques. This contract is being supported under an interagency agreement with DHHS/ASPE. The Health Expenditures Model will be estimated simultaneously with the Consumer Expenditures Model to provide one consistent demand system.

A contract for Update and Revision of the Macroeconomic-Demographic Model was awarded in September 1984. It has also been extended to FY 1986 in order to coordinate its activity with the consumer and health expenditure modeling. This contract was coordinated with DHHS/ASPE, which is particularly interested in the analysis of social security data. A publication will be prepared on the future of the retirement income system.

Microeconomic research in this office was focused on wealth studies. An article entitled "The President's Commission on Pension Policy Household Survey 1979: Net Wealth Distribution by Type and Age" was published in the September 1985 issue of the Review of Income and Wealth. A project was also initiated to study the wealth-age profile with the inclusion of rights to private pensions and social security.

A pilot study on the Evaluation of Senile Dementia Costs was completed. This study led to the preparation of the following papers:

Economic Costs of Senile Dementia: Issues and Recommendations (Cartwright, Hu, and Huang)

Evaluation of the Costs of Caring for the Senile Demented Elderly: A Pilot Study (Hu, Huang, and Cartwright)

Cost of Illness and the Elderly (Cartwright, Hu, and Huang)

The Economic Cost of Senile Dementia in the United States, 1983 (Huang, Hu, and Cartwright)

A Review of Prevalence and Incidence of Senile Dementia Among the Elderly Population (McDonnell, Hu, and White)

These papers are now being prepared for publication.

A computer model was developed under contract to provide an interactive graphical display of trends in the elderly that will depict long-term trends on future health needs, health conditions, and economic factors. European trends may be examined and compared to U.S. trends as well.

Research Highlights, FY 1985

- The article "The President's Commission on Pension Policy Household Survey 1979: Net Wealth Distributions by Type and Age" was published. Along with other findings, it states that net wealth for those 65 and over was $61,957, which included imputed values of employer-based pensions, but no social security values.

- An evaluation of the costs of dementia in older people was completed. Total direct costs are estimated to be 38.4 billion dollars. Of this, community home care costs were 26.7 billion dollars.

- Joseph Anderson and Emmanuel Thorne, investigators on the contract "Health Expenditures and the Aging Population," presented a research paper entitled "Estimates of Aggregate Personal Health Care Expenditures in 1980--Comparisons of the National Health Accounts and the National Medical Care Utilization and Expenditures Survey Data" to the National Center for Health Statistics. They found that the National Medical Care Utilization and Expenditures Survey accurately captured household sector payments, but differences exist in Government payments in the two data sources.

Overview of Program Plans, FY 1986-1989

FY 1986. With the completion of three contracts related to the Macroeconomic-Demographic Model, the editing and publishing of reports will be emphasized. Priority will be given to monographs on the retirement income system, social security legislation, and health expenditures. Model descriptions will then be considered for possible publication.

A second area of intense activity will address the Microeconomics of Aging, Health Status and Conditions, and Health Expenditures under a new contract. The first year will be devoted to extensive review of health economics literature as well as the development of a health expenditures simulation model for older people. Analysis of NHANES I Epidemiologic Followup data will be initiated with particular interest in retirement and health. More work will be undertaken to publish results of the study on the costs of senile dementia.

FY 1987. The overall strategy for 1987 will be to maintain the programs initiated for the study of population aging and the macroeconomy. Final reports related to the Macroeconomic-Demographic Model will be published. The new initiative in microeconomics and aging will be completed and will provide insights into older people's demand for health services. Work will focus on publication of these results. A new generation of studies that would improve the first-round attempt at modeling the macroeconomy and demography will be considered as well.

If staffing levels permit, a number of new studies can be undertaken in this office. The population model can be expanded for a fuller incorporation of behavioral aspects of fertility and mortality. For institutionalized older people, an important study can be made of the dynamics of the nursing home population with emphasis on the elderly subpopulation. International comparisons of vital statistics and socioeconomic characteristics would also be valuable to aging studies. Analyses can be conducted on secondary data sources from the Census Bureau, NCHS, Housing and Urban Development, Department of Labor, and the SSA, taking advantage of a vast accumulation of data that is not currently being utilized for research purposes.

FY 1988-1989. With further augmentation of staff, more areas of research can be approached. Studies can be undertaken in such areas as:

Health and Retirement. There is considerable concern with the functioning of older people in retirement. Demographic studies of work ability, functional ability, and population aging would provide important information on this aspect of growing older.

Mortality, Morbidity, and Long-Term Care. There is considerable controversy about whether older adults will experience additional years of relatively good functioning or relatively poor functioning during their retirement. The study of trends in mortality and morbidity should include demographic modeling of the determinants. Such modeling has implications for the delivery and costs of long-term care.

Financial Resources. Since many older people are not in the work force, they are dependent on a variety of sources of income and wealth in order to maintain their life styles. Various institutions such as social security and private and public pensions are involved in providing these resources. There will be a continued interest in these institutions and the well being of the people they serve.

Biometry Office

The Biometry Office conducts intramural and contract-supported research in the mathematical, statistical, and numerical aspects of aging and health. (1) The office devises, develops, and modifies methodologies for use in research programs related to aging and older people. (2) It conducts statistical analyses of morbidity and mortality trends and studies patterns of dying as well as environment and climate effects on health and disease. (3) It supervises and trains research investigators in statistical methods and study designs and analysis. (4) It collaborates with investigators in the other offices of the EDB program, in intramural and extramural programs of the NIA, in other Government agencies, and in the private sector.

Developmental Activities and Achievements, FY 1985

This year's activities and achievements in the Biometry Office paralleled those of previous years, including initiation and maintenance of intramural and contract-supported research and continued methodological consultation and statistical support for research programs conducted by other EDB offices, other NIA programs, and organizations outside the Institute. An increasingly large share of Biometry Office resources (staff and budget) was consumed by a variety of data management activities and statistical computing in support of the EPESE and NHANES I Epidemiologic Followup projects, the two largest data-producing projects of the EDB program.

As mentioned above, involvement in data management and statistical analysis of data from the EPESE projects continued at a high level. The EPESE Resource Data Book is now nearing completion, with all tabular and graphical material having been finalized. Draft texts for all the chapters were completed and reviewed by the EDB in-house review group and approved for publication by the EPESE principal investigators. The technical appendices, including fitting of generalized variance functions to the Yale data, are in preparation.

As work on the baseline survey data book wound down, activity began to pick up in other aspects of the EPESE projects. Data tapes containing the first and second telephone followup interview data were received from each of the three centers. In addition, endpoint data topes are being received from the three locations, including data on hospitalizations, nursing home admissions, and mortality. Cause-of-death infromation is included on the mortality tape, having been coded by the nosologist for the state of Iowa under contract to the Biometry Office. The coding activity will continue as deaths occur in the three populations.

The arrival of the first endpoint data marked the beginning of another activity with the EPESE data, namely "core" analyses to be done collaboratively by the investigative teams and EDB staff. Several committees were appointed to conduct these core analyses in the areas of mortality, hospitalization, nursing home utilization, and disability. For each endpoint topic an overall coordinating committee was appointed, with subcommittees established for analyses relating various exposure data for the particular endpoint of interest. An EDB staff member was named chairman of the mortality endpoint coordinating committee, which also has responsibility for analyses relating demographic characteristics to mortality. This group will oversee the work of five subcommittees relating various exposure characteristics to mortality. The committee met in July 1985 to make plans for the analysis of demographic characteristics and outline steps to be taken in completing the analysis. Another staff member is on the coordinating committee for core analysis of disability as an endpoint. He is currently developing an index of disability for possible use in the core analysis.

The Biometry Office staff continued its involvement in several other aspects of the EPESE projects. The Documentation Committee, which is chaired by a member of this office, met twice during the year. This group developed common specifications for formatting the baseline survey, telephone followup surveys, and mortality, hospitalization, and nursing home data sets. With the award of a contract to Duke University for a fourth center, it will be necessary to orient the new investigators to the activities of this committee and work closely with them to insure standardization of procedures, documentation, formatting, and data management across all the centers. Staff also worked with the Office of Management and Budget (OMB) to obtain clearance of survey forms and documents. Finally, a contract was awarded to study patterns of incomplelte responses in the Iowa baseline survey. Characteristics of refusals in the East Boston location will be studied as well.

In early 1985, the EDB program received the data tapes for the full data collection of the NHANES I Epidemiologic Followup Survey. Since that time, data management and analytic activities have increased substantially. Many of the working groups formed earlier (with receipt more than a year ago of the data from the Northeast Region) began to meet and divide up the work involved in carrying out literally dozens of analyses on these data. National Cancer Institute staff have generously offered to share computer files they created from the raw data to help save expenses of on-line storage. EDB is working closely with National Cancer Institute staff in this effort.

Analyses already under way span a wide variety of topics including height, weight, other anthropometry, functional ability, blood pressure, arthritis, and a host of other exposure and endpoint variables. Data analysis for drafts of two papers on hearing loss was completed. One analysis relates hearing loss and bone density. The other makes methodological comparisons between pure tone audiometry and self-assessment hearing scales. Additional analyses undertaken by EDB staff address weight and weight history, arthritis, and blood pressure. A group also began an analysis of the circumstances of death as ascertained from proxies of individuals in the original NHANES I who died before the followup study was done. Many of the questions in this latter analysis were included in the Survey of the Last Days of Life, which will be discussed below.

Nutrition is the subject of another contract initiated by EDB staff. The purpose of this project is to achieve commonality between the NHANES I and

Followup Survey food groupings and to examine eating patterns in older people. A good deal of further work is anticipated in this area after the completion of this beginning effort.

As mentioned above, the Survey of the Last·Days of Life continued throughout FY 1985. After a lengthy delay in obtaining OMB clearance of the questionnaire in 1984, a pretest was conducted in the study area (Fairfield County, Connecticut) in the summer of 1984. Analysis of the pretest results showed that the basic methodology of approaching the informant 3 months after the death of the decedent would elicit the response required for successful conduct of the study. Further results of the pretest showed that some changes in the questionnaire would be necessary to eliminate awkward sequencing and high incompletion rates for some questions. After revisions were made, the study went into the field in January 1985. At a recent site visit to the fieldwork contractor, it was learned that excellent progress is being made in the data collection phase of the study. Close examination of the first two months' data showed that response rates are continuing at an 85 percent level, and the data are showing the expected patterns based on the pretest data. The fieldwork will continue until March 1986, and data should be available for analysis in the fall of 1986.

A member of this office continued to serve on the interagency consulting group for the National Mortality Followback Survey (NMFS) being conducted by NCHS. This survey, based on a national probability sample of 20,000 deaths, is designed to collect information from the next of kin listed on the death certificate. Topics for the survey include health care in the last year of life, life style factors and the risk of "premature" death, socioeconomic differentials in mortality, and the quality and reliability of non-cause-of-death items on the death certificate. Because of the similarity between this study and the Survey of the Last Days of Life (see paragraph above), an interagency agreement was executed with NCHS this year to support the study. As a result, questions on nursing home utilization and cognitive function taken from the Last Days of Life questionnaire are included in the NMFS and will provide national norms to which data may be compared. A pretest was conducted, and, although final results will not be available for some time, preliminary results indicate that the methodology and questionnaire appear to work well. Plans call for the analysis of the pretest and revision of procedures to be completed in late 1985 and for the main study to begin in January 1986.

Interest in the National Nursing Home Survey (NNHS) continued in FY 1985. Following the pretest in 1984, it was found to be infeasible to implement a full admissions cohort to be followed over time as part of the 1985 NNHS. Instead, NCHS began to implement collection of information on the next-of-kin component to be used to describe the nursing home utilization patterns of persons admitted to nursing homes in a specific time window. As with the NMFS, EDB supports this study with an interagency agreement.

EDB continued to update its previous analysis of national mortality data for U.S. elderly. The latest available mortality and morbidity data on cancer in older people were presented at a recent meeting in Israel. Work continued on the analysis of those data. In addition, EDB was asked to update two chapters recently published on epidemiologic and statistical characteristics of the

U.S. elderly population. Further, development began on a contract to reopen the topic of climatic extremes and mortality in older people.

Two other topics deserve mention in this report. As clearly indicated earlier in this narrative, a great deal of effort is going into analyses and studies based on the NHANES I and its associated Followup Survey. Since this study was originally designed as a complex sample survey, the assumptions required for standard statistical analysis techniques are not met or, in some cases, even approximately met. Therefore, to make optimum use of these data, considerable work in methodology development needs to be done. The National Institute of Child Health and Human Development (NICHD) recently awarded a contract for the study and development of methods for performing regression analyses on complex survey data. Since this topic is highly relevant to the NHANES analysis, and since one of the products of this work will be software to be applied to these data, EDB proposed to join with NICHD through an interagency agreement to support this research and extend the scope to topics highly relevant to NIA interests.

The other topic of interest in this area is longitudinal data analysis, especially as it may apply to EPESE data. A contract was drafted to evaluate ways of analyzing longitudinal data, specifically to assess the "bootstrap" as a tool for the study of longitudinal data to estimate the degree of a polynomial, to find simultaneous confidence bands for a repeated response at all time points, and to estimate the distribution of a new test for trend. These developments, while mathematically complicated, should make the data even more useful.

Research Highlights, FY 1985

Much of the research of the Biometry Office is concerned with development of methodology for data collection, data management, and statistical analysis. Consequently, many of the research highlights are related to these activities and do not necessarily reflect new knowledge in substantive areas, although such findings do emerge from this work.

- The pretest/feasibility study for the Survey of the Last Days of Life was completed, showing that the methodology of conducting followback interviews with the next of kin of a recently deceased older person was successful. A highlight among substantive results from this pretest was a reported 12 percent prevalence of diagnosed dementia among the pretest sample.

- The final version of the EPESE Resource Data Book has been completed, containing a wide variety of baseline demographic, social, economic, and health characteristics. This book provides, for the first time in one place, prevalence data for numerous chronic conditions, physical and mental functioning measures, health habits, and other characteristics of older populations, cross-tabulated by age and gender.

- The first collaborative analysis of EPESE baseline data was published in the Milbank Memorial Fund Quarterly in FY 1985. Among other findings included in this paper is a documentation of the rise in prevalence of functional disability with age and higher levels of disability for females than males in the East Boston and New Haven populations.

- A study has been completed on the development of statistical methods for examining incomplete data in the Iowa EPESE baseline survey. The study successfully identified factors predictive of item nonresponse for survey questions on bowel and bladder problems, depression scores, and the cognitive recall test. The investigation resulted in the identification of separate subpopulations (defined by such variables as age, sex, marital status, education, etc.) for imputations, so that corrections for missing data adequately reflect the patterns of missing data that were actually observed in the survey.

- A report has been completed on a study of eating patterns in the older people based on analysis of data from the NHANES I and the Followup Study. The investigator established a set of rules for comparing food groupings from the two studies.

- The National Center for Health Statistics--with support from an interagency agreement from NIA--completed a pretest of the National Mortality Followback Survey. This pretest established the feasibility of conducting such a national survey by mail.

- An analysis of diabetes data from the National Health Interview Survey (NHIS) was published in the American Journal of Clinical Nutrition. The results showed an additive as well as interactive effect of rising diabetes prevalence with increasing obesity while controlling for age, sex, and race in the NHIS sample. These results generalize to the U.S. civilian, noninstitutionalized population alive at the time the survey was conducted.

FY 1986. Plans for this year as in the past include a substantial number of continuing projects from FY 1985. As more EPESE data accumulate, a large proportion of staff effort will go into data management and analysis work. The recent receipt of the first followup data will mean a substantial effort to prepare the data for analysis. The "core" analyses of endpoint data--mortality, hospitalization, nursing home admission, and disability--will likewise consume a good deal of staff resources with the expectation of a relatively quick and satisfactory payoff. The NHANES I Followup data are also expected to provide a large number of useful research results. As the fourth EPESE location in Durham, North Carolina, enters the field, additional staff involvement with the contractor will be required to monitor data collection activities and to orient the investigators in the standard procedures for data management adopted by the other three centers.

In other areas staff anticipates the completion of data collection for the Survey of the Last Days of Life and the beginning of data processing and editing leading to a program of analysis for FY 1987. The National Mortality Followback Survey will initiate its data collection in 1986, and the data collection for the National Nursing Home Survey will have been completed.

New activities to begin in 1986 include a methodological project in collaboration with NICHD to investigate methods for conducting regression analysis with data from complex surveys such as the NHANES, further analysis of NHANES nutrition data, and projects to study improved methods for longitudinal data analysis and for measuring the association between climatic extremes and mortality in older people.

FY 1987. Data collection for the Survey of the Last Days of Life will have ended, and data analysis and publication of results will begin. Data analysis for the National Mortality Followback Survey will also begin, at least the planning stages, in FY 1987. Data collection for the National Nursing Home Survey will also have ended, with analytical activities getting under way. The NHANES continuation studies will utilize a significant proportion of Biometry Office staff resources at various stages of development.

In addition, statistical support will be required for newly emerging data from all four locations of the EPESE, from EPESE studies of the oldest old, and from the proposed Hispanic NHANES Followup.

Further, staff will initiate a reinterview program for the National Mortality Followback Survey. This is an important quality control mechanism that was not included the survey. It will greatly aid in protecting the integrity of the valuable data to be obtained from this study.

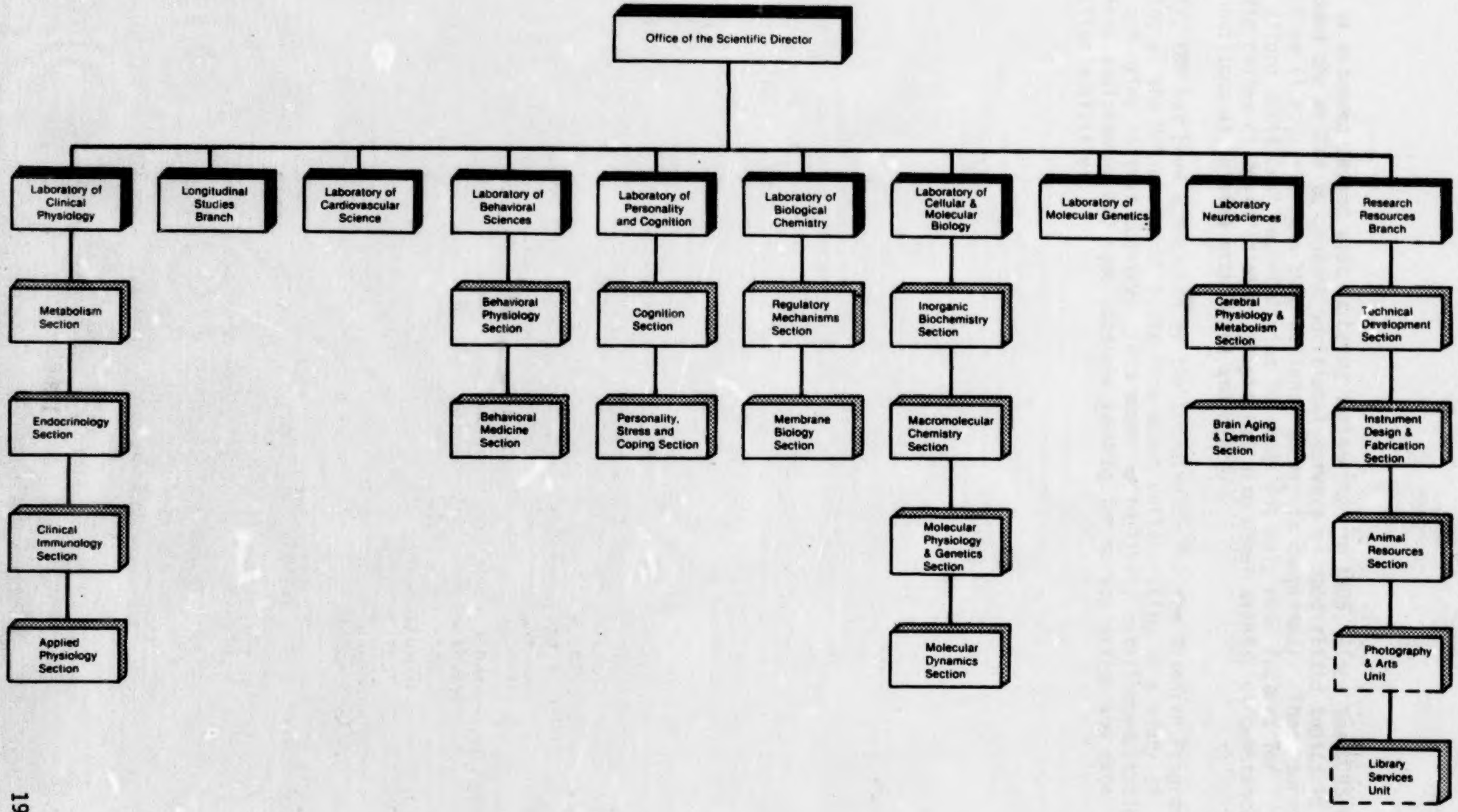
FY 1988-1989. In addition to the activities in major areas outlined above, the Biometry Office must be prepared to respond to the requirements of other EDB offices to provide the necessary support for their initiatives. An example is the development of new research programs in demography and microeconomics. Further, as the size of Government decreases and data become increasingly available, it becomes more important for this program to take on the role of research arm for the data collection agencies. Otherwise, the full exploitation of these valuable data may never be realized.

The Biometry Office maintains an interest in studying utilization of nursing homes by the older population and in particular, transitions into and out of such facilities and reliable measures of length of stay. However, previous surveys of nursing home populations have provided either prevalence estimates based on a sample of residents or estimates based on a discharge sample. Both of these methods inaccurately represent the true patterns of nursing home use, since neither can provide unbiased estimates of both long- and short-term stays. The most appropriate solution would be to collect prospective data from a cohort of admissions. Since the Admissions Supplement of the 1985 National Nursing Home Survey has been eliminated from the NCHS plans, EDB proposes to initiate this study either on its own or in collaboration with other interested agencies. Such an undertaking will require either a large contract or an interagency agreement and the addition of staff to this office.

Another area receiving high priority in future plans is the study of death and dying. In addition to the germinal study of how older people die (The Last Days of Life), support of the NCHS National Mortality Followback Survey series would be extended beyond what is being implemented in 1985, since the NCHS has expressed the desire to conduct additional surveys on specialized topics in the future (i.e., after the 1986 national survey is completed). These surveys would afford additional opportunities to study not only risk factors for specific causes of death in older people but also other events, circumstances, and conditions associated with death and dying.

Finally, EDB has been approached by the Coordinator for the Research Program on Aging at the University of Costa Rica about collaborating on a study of death and dying in that country. This study would likely entail consultation, technical assistance, and some possible funding for survey design and data collection activities.

Intramural Research Program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10/1/85

INTRAMURAL RESEARCH PROGRAM (IRP)

This program encompasses the research and training activities conducted at the Gerontology Research Center (GRC) in Baltimore, Maryland, and those of the Laboratory of Neurosciences housed in the NIH Clinical Center on the NIH campus in Bethesda, Maryland. In addition to the basic and clinical research conducted by NIA intramural investigators, the IRP is a major setting for postdoctoral training in biomedical and behavioral science related to gerontology and geriatrics.

The past year has been one of substantial change--the IRP structure has been reorganized as shown in the chart on the opposite page; and innovative arrangements with other research organizations that are designed to capitalize on shared interests and combined expertise and that have been in the offing for several years have now been put in place. These developments, which are highlighted below, seek to reap the maximum scientific benefit from limited resources.

Intramural Management

After extensive appraisal of its structure and content, the IRP was reorganized during the past year. The purposes of this reorganization are several: to promote increased scientific productivity and efficiency in IRP operations, to ensure that the allocation of resources reflects Institute priorities, to minimize the impact of personnel reductions, and recognize the past achievements and future potential of highly productive programs and program leaders.

A new Laboratory of Molecular Genetics, under the acting leadership of the NIA Deputy Director, is now being established to integrate the powerful tools of recombinant DNA technology into the scientific fabric of the IRP. An in-house presence in molecular genetics has been a priority concern of both the NIA leadership and the NIA Board of Scientific Counselors. In contrast to the de novo creation of the Laboratory of Molecular Genetics, two other new laboratories represent the conferring of heightened organizational stature to ongoing programs. The new Laboratory of Personality and Cognition (LPC) will conduct basic and clinical research on individual differences in cognitive and personality processes and traits and investigate the influence of age on these variables and their reciprocal influence on health, well-being and adaptation. LPC's parent organization, the Laboratory of Behavioral Sciences, will now emphasize clinical studies of behavioral interventions in the treatment of age- related medical disorders and basic research on age changes in central neural control mechanisms, especially those impacting on autonomic function.

The new Laboratory of Cardiovascular Science will continue the extraordinarily productive multidisciplinary studies of aging in the cardiovascular system, encompassing both fundamental research on the mechanisms of excitation-contraction coupling in cardiac muscle and clinical investigations of age-related changes in myocardial structure and function. Its former parent organization has been renamed the Laboratory of Clinical Physiology and its structure streamlined through the divestiture of responsibility for the operational aspects of the Baltimore Longitudinal Study of Aging (BLSA).

The former Laboratory of Molecular Aging has been reconstituted as the Laboratory of Biological Chemistry (LBC) and two sections created. The LBC research program will focus on the nature and control of membrane transport systems, as well as on the metabolic and chemical basis for changes in these systems with age. Special emphasis is given to membrane-mediated regulation of mineral metabolism. The ongoing Laboratory of Cellular and Molecular Biology has added a fourth Section for studies of the relation between molecular dynamics and changes in function during aging. The structure of the Laboratory of Neurosciences remains unaltered.

Research resource and support services have been consolidated under the new Research Resources Branch to promote increased efficiency and responsiveness in serving the needs of intramural investigators. This change, together with the abolition of two Sections and reassignment of their personnel to high priority and understaffed scientific programs, reduces the number of staff and functions in the immediate Office of the Scientific Director to more manageable proportions.

The final major change was the establishment of a new Longitudinal Studies Branch to provide a discrete organizational focus for central BLSA management and operational functions. This change responds to recommendations of the Board of Scientific Counselors and reflects the reality that the BLSA is a central resource that transcends a specific program and is relied upon by a substantial number of intramural investigators. Further, a new leadership position--the Associate Scientific Director for the BLSA--was established, and an out-standing individual selected to fill it. In concert with the BLSA Steering Committee, an internal group charged with scientific oversight for the study, the BLSA Associate Scientific Director is promoting collaborative studies, increased use of BLSA data (e.g., analyses to explore the characteristics of successful aging), and research opportunities (e.g., serial study of gender differences) made possible by the BLSA's highly characterized population, wealth of longitudinal data, and multidisciplinary and multivariate approach.

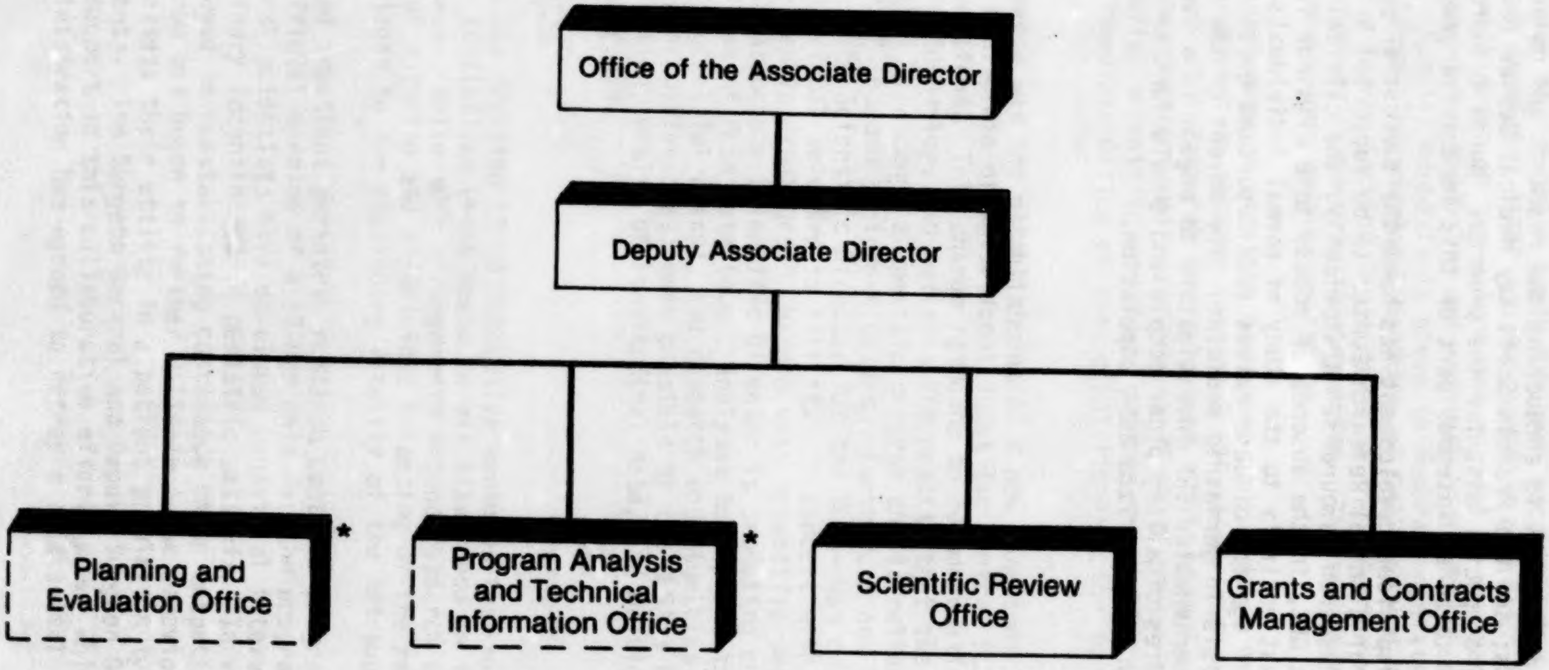
Collaborative Efforts

This year has seen the fruition of collaborative ventures that will enable the IRP to develop new initiatives which would in all likelihood be foreclosed by a unilateral approach. While such arrangements extend research capabilities, they require careful nuturing and a judicious balancing of the relative advantages and disadvantages to the continuing vitality of the intramural program.

The much anticipated inpatient geriatric research contince program became a reality with the official opening of a 15-bed unit for the program in October 1985. NIA intramural scientists have developed behavioral interventions to treat fecal and urinary incontinence in geriatric patients. In view of the success rates achieved in reestablishing continence on an outpatient basis, the inpatient program was begun to further validate these behavioral treatment modalities and to assess their utility in a patient population typical of nursing home residents. The Surgeon General and Deputy Surgeon General have lent their active support to this collaborative effort, under which the Health Care Financing Administration has agreed to defray a substantial portion of the clinical costs; NIA is conducting the research and underwriting the research costs; and the Francis Scott Key Medical Center (FSK) in Baltimore has allocated a special unit for the program. Nurse researchers have been and will continue to be an integral part of this innovative program.

An equally auspicious development has been the successful pursuit of a joint GRC/FSK General Clinical Research Center to be supported by NIA and the NIH Division of Research Resources. Historically, the clinical research activities at GRC, in the absence of access to a clinical facility, have been confined almost entirely to the study of normal individuals. However, the interaction of age and disease raises such important questions as to mandate a greater emphasis in geriatric medicine. The advent of the General Clinical Research Center enables IRP investigators to engage in a variety of on-site research studies of ailing older people and should further enhance the utility of the highly characterized BLSA population.

Office of Extramural Affairs


Office of the Associate Director
Deputy Associate Director
Planning and Evaluation Office*
Program Analysis and Technical Information Office*
Scientific Review Office
Grants and Contracts Management Office

*Transferred to the NIA's new Office of Planning and Program Analysis, which will begin formal operations in fiscal year 1986.

6/1/84

OFFICE OF EXTRAMURAL AFFAIRS (OEA)

This office, with its two component offices, the Scientific Review Office (SRO) and the Grants and Contracts Management Office (GCMO), has primary responsibility for the review and management of extramural activities of the National Institute on Aging. These functions include extramural policy development, interpretation, guidance, and implementation; primary and secondary review of research grant applications; technical review of research contract proposals; and administrative management of grants and contracts.

Office of the Associate Director (AD/OEA)

The AD/OEA is the focal point for the formulation, interpretation, and implementation of policies and procedures for the Institute's extramural research and development activities, which include research grants, training grants, cooperative agreements, intra/interagency agreements, and research and development contracts. The AD/OEA manages and conducts the secondary review of grant applications by the National Advisory Council on Aging. He serves as the Institute's extramural training officer and provides oversight for the Institute's scientific review and grants and contracts management functions. Throughout most of FY 1985 the AD/OEA also continued to supervise the Program Analysis and Technical Information Office (PATIO). The planning, evaluation, and legislative functions were assigned to other NIA offices early in the second quarter of the fiscal year.

Selected Program Activities in FY 1985

During the past year, the AD/OEA:

- o Continued to represent the Institute at the biweekly meetings of the NIH Extramural Policy and Management Committee (EPMC), the major forum for information dissemination and coordination of policies and procedures among NIH components.

- o As Chairman of the Committee on Program Policy and Management (CPPM), informed NIA staff of issues raised at the EPMC meetings along with other issues that required discussion and/or resolution within the Institute. In FY 1985 these meetings served as a means of exchanging information on various activities and addressing problems that cross-cut the Institute, such as contract status, budget projections, legislation, changes in policies and guidelines, activity scheduling, and funding strategies.

- o Served as the NIA locus for the resolution of fraud and abuse issues. Of the two incidents that occurred, both are being resolved at the NIA level.

- o Continued to serve as the Institute's appeals officer.

- o In collaboration with SRO and GCMO, developed and implemented policies and procedures for all Institute activities related to the submission and review of applications for research grants, contracts and intra/interagency agreements. Activities included amendment of the program project application guidelines to delete the limitation on dollar amounts and number of years of total award and to incorporate new NIH-wide program project standards into NIA criteria.

- Provided coordination and review of proposed program announcements and requests for applications (RFAs).
- Coordinated the extensive revision of NIA's referral guidelines for the assignment of applications by the NIH Division of Research Grants (DRG). Overlap negotiations have been completed with most NIH Institutes and Divisions as well as with the National Center for Health Services Research, the Food and Drug Administration, the National Institute of Alcoholism and Alcohol Abuse, the National Institute of Occupational Safety and Health, and the Division of Nursing of the Health Resources and Services Administration. Negotiations with the National Institute of Mental Health and the National Institute of Neurological and Communicative Diseases and Stroke are in progress.
- Coordinated the development of the new Geriatric Leadership Academic Award (K07), which provides support for program leadership activities in aging research and aging research training.
- Assisted in the development of the Complementary Training Award for Research on Aging, which helps established research training programs to increase their efforts to train investigators for careers in aging.
- Served as the Chairman at the Contracts Advisory Committee meetings, which reviewed and recommended to the Director, NIA, new research contracts and intra/interagency agreements. Primary coordination and information exchange was accomplished bimonthly at CPPM meetings. Fiscal analyses of contract status were distributed monthly.
- Provided assistance in the preparation of the document, Training and Career Development Opportunities for Research on Aging.
- Coordinated the update of NIA areas of interest in the 1985 Small Business Innovative Research (SBIR) award omnibus solicitation.
- Obtained approval for the cofunding initiative for unfilled positions on ongoing T32s of other Institutes and Divisions and arranged a waiver at the Department level for peer review for other T32s without open training slots.
- Served as contact for the new Academic Research Enhancement Award (AREA), which was legislatively mandated for FY 1985, with a set-aside of $5,000,000.
- Completed refinements of rebuttal and appeal of the review process, which were formalized at the May 1985 meeting of the National Advisory Council on Aging (NACA). This process requires that, if possible, rebuttals are to be resolved at the program staff level in cooperation with the study

section executive secretary. Unresolved differences of opinion about a rebuttal to review will be sent to NACA members with the final mailing, in addition to inclusion in the special action folder. Depending on staff or council recommendations, the rebuttal will either be approved or disapproved by NACA. If it is disapproved, appeal may be directed to the Office of Extramural Research and Training, NIH.

- Developed new implementation memorandums and policy statements to establish Institute procedures for management of joint venture activities, research contracts, cooperative agreements, cofunding of ongoing training grants, and rebuttals. In cooperation with the Council Data Committee and PATIO staff, revised the data reporting system for each council round and finalized implementation of all recommendations at the May 1985 council meeting.

- Prepared and conducted the precouncil meetings, council recall, and postcouncil meetings, which now focus on funding decisions for the individual council round.

- Prepared agendas, managed Council-related materials, and identified council issues, including solicitation of recommendations for special actions from NIA staff and Council members and assignment of Council discussants.

- Completed the basic NIA Automated Summary Statements System. This system moves NIA generated summary statements through a series of special editing, conversion, transfer, and preparatory programs in order to feed them into the NIH Automated Summary Statement System developed by DRG for the final production of council books. Maintainance and further refinements are in progress. The system permits production of both hard copy and microfiche.

- For first and second mailings and at council time, provided summary statements from the automated system for each council member, excluding conflicts of interest. Provided file copies of the summary statements to GCMO.

- Replaced the central processing unit (CPU) and software of the 5520 system with a model with twice the memory capacity that had been discarded by the Fogarty Center. The capacity of the original system was reached by mid-1985, and until the new system was installed, use of the system had to be limited to essential GCMO and SRO activities.

- Coordinated the development of funding authorization memorandums and the preparation of the NIA funding lists for precouncil, council, and postcouncil phases.

- Further developed the orientation process for council members to provide an overview of the NIA organizational components with which council primarily interacts, as well as a briefing on council review of applications. Beginning in FY 1986 new council members will receive reference documents, including (1) a council orientation manual; (2) an NIH manual issuance on review of NIH programs and grant and cooperative agreement applications by National Advisory Councils and Boards; (3) background information on scientific review and coding of grant applications; (4) current NIA program announcements; and (5) the most current Report to Council on Program.

- Provided review expertise in numerous capacities in support of FY 1985 review activities. Specific review activities handled by the AD/OEA included review of Small Grant applications in the animal area; technical merit review of the "Household Formation" and "Microeconomic Update" contract proposals; and conduct of selected center and program project application site visits. The AD/OEA managed the review process for the Alzheimer Disease Reseach Center proposals.

- Continued the editorial review of summary statements prepared by SRO. Statements were assessed in terms of clarity, accuracy, format, and adherence to NIH policy.

- Served as the NIA training officer and was responsible for the review and approval (or disapproval) of annual National Research Service Award payback activities for all recent NIA fellows and trainees for fulfillment of their research commitments.

- Coordinated the preparation of standard reports on trans-NIH issues and research inventories, including annual or biannual inventories of NIA research in the following areas: population research, senile dementia, hypertension, diabetes, nutrition, arthritis, prevention, Down's syndrome, maternal and child health, substance abuse, and heart, lung and blood diseases and blood resources. These reports were prepared by a staff member of PATIO.

- Coordinated the preparation of the following special reports:

  - The Catalog of Federal Domestic Assistance for the Office of Extramural Research and Training, NIH

  - The "Survey of Federal Agency Management of Discretionary Grants" for the General Accounting Office

  - The FY 1986 Public Health Service Annual Plan for the Historically Black Colleges and Universities Initiative

  - The FY 1985 Health and Human Services Inventory of Health, Social and Demographic Data Projects and Systems for the Office of Planning and Program Evaluation, NIH

  - The annual survey of Institute-supported development of orphan drugs. In addition, inquiries concerning the NIH joint-Institute announcement of Research Grants for Clinical Testing of Orphan Products for Rare Diseases were handled by AD/OEA

  - The development and submission of the annual Basic/Applied/Developmental Report for the Office of the Director, NIH (OD/NIH)

- o Continued to manage the electronic communication link to NIH for OD/NIH activities related to planning, evaluation, review, and extramural affairs.

Program Plans for FY 1986

AD/OEA will continue to provide guidance and interpretation for policy issues related to NIA extramural affairs and to recommend, advise, and participate in policy development related to NIA and NIH-wide issues.

Specific new major initiatives for FY 1986 include:

- o Development and organization of SRO and GCMO functions as extramural branches within OEA.
- o Establishment of updated Institute policies and procedures for handling unsolicited proposals, intra/interagency agreements, program announcements, and requests for applications.
- o On a trial basis, provision of microfiched summary statements with microfiche readers for council members, upon request. The option of using microfiched summary statements and portable readers is planned for FY 1986. On request, council members will be provided with microfiche and readers or hardcopies of council books. If desired, microfiche readers can be provided to all council members along with copies of microfiched summary statements. Use of microfiche by all council members will save approximately $6,000 per year.
- o Development of an NIA council handbook designed to serve as an orientation document and reference for all council members.
- o Formalization of the functions for research contract reports and administration.
- o Establishment of written guidelines for extramural support of cofunded positions on T32s.
- o Refinement of joint endeavors guidance for the Institute.
- o Development of a resource file for NIA extramural policies and guidelines.

Scientific Review Office (SRO)

This office provides initial technical and scientific merit review for 15 separate types of grant applications, for cooperative agreements, and for all contract proposals assigned to the Institute for evaluation. The SRO is responsible for the identification, development, recruitment, and management of both chartered and ad hoc review groups of extramural scientists for this function, and for the reporting of actions taken by these review groups in the form of summary minutes and statements. Therefore, the major responsibilities of SRO, i.e., grant and contract review, referral, and consultant development, are mandatory functions dictated by the fundamental mission of the NIA. With other units of OEA, the SRO also seeks to develop, maintain and improve the information bases available to the Institute to provide maximum information to the officials responsible for extramural decision-making and planning.

Developmental Activities and Achievements, FY 1985

SRO handles one of the heaviest workloads per capita of any review component at the NIH. During FY 1985 this office reviewed over 700 individual components in 15 different grant categories, as well as proposals received in response to 6 contract Requests for Proposals (RFPs).

A summary of review meetings convened for the year is given below.

Chartered Grant Review Meetings	5
Contract Review Meetings	6
Ad Hoc T32 Training Grant Reviews	3
Ad Hoc P01 Program Project Reviews	17
Ad Hoc R03 Small Grant Reviews	8
Ad Hoc P30 Specialized Center Reviews	1
Ad Hoc K11 Physician Scientist Award Reviews (Individual)	1
Ad Hoc K12 Physician Scientist Award Reviews (Institutional)	1
Ad Hoc R13 Conference Grant Reviews	1
Ad Hoc P50 Alzheimer Disease Research Center Reviews	1
Ad Hoc R44 Phase II SBIR Reviews	1(Conf. Call)

Ten ad hoc review meetings were conducted by teleconferencing during the year, for a significant savings in travel costs to the Institute.

Grant applications received for review in FY 1985 are as follows:

P01 Program Projects	45
P30 Specialized Center Grants	1
P50 Alzheimer Disease Research Centers	12
K01 Special Emphasis Research Career Awards (SERCAs) in Behavioral Geriatrics	9
K07 Geriatric Leadership Academic Awards	9
K08 Clinical Investigator Awards	4
K08 Academic Awards	8
K11 Physician Scientist Awards (Individual)	4
K12 Physician Scientist Awards (Institutional)	2
R03 Small Grants	179
R13 Conference Grants	7
R44 SBIR Phase II Awards	1
T32 Training Grants	16

In support of the review of these proposals, 39 site visits were made.

The following contracts were reviewed in FY 1985:

RFP No.	Title	Date of Review
84-08	Development and Maintenance of a Long-Term Colony of Aged Hybrid Rats	12/03/84
---	Diet, Nutrition and Aging (unsolicited)	12/10/84
84-19	Household Formation (Small Business Concern)	12/19/84
84-15	Biomarkers of Aging	02/05/85
85-12	Microeconomics	07/08/85
85-09	Pathology Monitoring	07/18/85

A number of new and revised policy documents were completed in FY 1985. SRO developed and completed packages of review materials (including evaluation sheets, reviewers' instructions, and formats for reports) for Institutional Physician Scientist Awards and Geriatric Leadership Academic Awards. These documents also are of use to applicants in the preparation of these proposals. SRO, along with other components of OEA, also participated in the revision of NIA referral guidelines.

The second round of Alzheimer Disease Research Center (ADRC) applications was reviewed in FY 1985. Twelve applications were received. The AD/OEA took the responsibility for setting up the review process, conducting the site visits, chairing the ad hoc ADRC Review Committee in June, and preparing the site visit reports and summary statements for the September 1985 council meeting. The extensive data and exchange of information provided by the site visit process allowed a single review committee to vote on all proposals and ensured that maximum information was available to judge the merit of each proposal.

Staff limitations also resulted in the need for additional outside help to review over 100 small grants deferred for the September 1985 Council round. This task was assumed by staff of the Office of the Director.

As part of its ongoing activities, the SRO routinely provides the NIA Committee Management Office with data on review statistics, meetings, and budgets, along with drafts of revised or pending charters and reviewer biographical materials for use in submission of required documentation to the Department of Health and Human Services.

With respect to office resources, the SRO has fully developed and implemented a comprehensive database of information along with a computerized consultants' file that will ensure the most informed selection of consultants for review. A handbook for use of the available coordinated databases also has been developed. In addition, in FY 1985 the office fully implemented the use of the IBM 5520 system to produce all summary statements, which were then successfully integrated electronically to produce an all-electronic council book. The system has proved to be accurate and efficient, although the increased volume of review activity has taxed its CPU capacity much sooner than expected.

Microfiche reduction of applications and records has been initiated to reduce the storage, mailing, and xeroxing requirements of the office. After a successful pilot study, all grant applications in current SRO files and all new grant proposals received for review are now reproduced both in microfiche and hard copy. Microfiche is used for permanent files, and current backfiles are being microfiched to reduce space needs. In the coming year, selected members of NIA review committees will test the practicality of using microfiched grant proposals to review applications.

Perhaps the most significant achievement of FY 1985 is the impaneling of the Geriatrics Review (GER) Committee, which held its initial chartered meeting in March 1985. The Committee charter was first submitted in 1980 and was approved at a most opportune moment, since without its additional expertise and capacity, the Aging Review Committee would have been overwhelmed with applications. The clinical focus of the GER was especially timely for review of applications for Geriatric Leadership Academic Awards and the increased number of clinically oriented program projects.

Overview of Program Plans, FY 1986-1989

FY 1986. SRO will work with AD/OEA and program staff to identify mechanisms that may not be cost effective or that may be too small to serve the larger purpose for which they were intended. Among the possibilities are the Special Emphasis Research Career Award in Behavioral Geriatrics, the Academic Award, and the Clinical Investigator Award. Ways will also be considered to limit the number of program project applications received, such as requiring a specified level of current NIA support in order to qualify for submission of program projects and limiting competing supplements to core items only, with new research projects to be submitted as R01 proposals.

If more resources become available to SRO, or if fewer applications are received, then several higher order activities can be pursued to continue to improve efficiency and quality.

FY 1987-1989. SRO, in conjunction with AD/OEA, will evaluate the long-term needs of the Institute in terms of the scope and direction of research in aging. Major program initiatives, such as the Teaching Nursing Home awards and the Alzheimer Disease Research Center awards, will be up for renewal over this period, and, based on new initiatives indicated in NIA programs, the long-term development of chartered review capacity will be reassessed.

Internally, SRO will continue to evaluate how new methodologies may be applied to improve efficiency. Over the long term, the functions of this office are dictated by the choices for further development made by the Institute with respect to grant and contract mechanisms.

Grants and Contracts Management Office (GCMO)

The fundamental role of the Grants and Contracts Management Office is to provide assistance and expertise to the Institute and grantee community on all business management and fiscal aspects associated with the announcement, review, negotiation, award, and administration of grants. This office acts as a liaison between the Research Contracts Branch of the NIH Division of Contracts and Grants and the Institute's project officers to ensure the smooth execution of all documents for contracts and intra/interagency agreements, providing advice and assistance when necessary in order to expedite the process.

Developmental Activities and Achievements, FY 1985

This office monitored a total of 2,316 individual grants in eighteen different mechanisms, requiring the application of fifteen diverse sets of program guidelines and regulations governing each kind of award. In these various mechanisms, awards were negotiated and issued on 820 grants by the close of fiscal year 1985.

An additional 45 program project applications were administratively reviewed in detail to provide the basis for the recommended levels of funding for the individual summary statements. Of the 39 site visits made by the Scientific Review Office, the Grants Management Office attended only 27 to conserve travel funds and at the same time lend expertise where it was most crucial to the Institute's interests. Twelve of those site visits attended were for Alzheimer Disease Research Center applications.

GCMO staff also provided administrative review of 36 research career program awards, 25 individual and institutional training grant applications, and one center grant. Analyses were performed on 374 selected individual applications with a priority score under 240 to ensure accuracy of budget recommendations prior to the Council meetings.

By the close of FY 1985, 2,388 applications and summary statements were logged in, distributed, verified, and compiled for Council review. Approximately 754 books were prepared for Council and fellowship review meetings during the year.

The Scientific Review and Evaluation Grant generated 629 vouchers, which were audited and authorized for payment. Training grant programs required the review and verification of 420 documents on appointments, termination notices, and payback agreements.

Through the NIH 7000 computer terminal, which provides access to the database for the Institute's Fiscal Ledger System, this office maintained up-to-date information on budget commitments and obligations of grant and contract funds for the current fiscal year as well as future-year commitments. In addition, a Grants Status Report on pending awards was updated on a monthly basis to provide the latest information on the status of pending awards.

GCMO staff provided comments in specialized areas concerning policy for such topics as cofunding of training grants, the complementary training grant announcement, review appeals, joint endeavors with for-profit organizations, the Behavioral Geriatrics SERCA, the NIA Complementary Training Award, and the Geriatric Leadership Academic Award.

Overview of Program Plans, FY 1986-1989

FY 1986. GCMO plans to investigate methods of automation of selected manual recordkeeping processes in order to conserve manhours and increase productivity. GCMO staff will be working closely with other NIA staff to develop programs in this regard.

Programs will be developed to capture up-to-date information on NIA training appointments, termination notices, and payback records. In addition, plans are underway to computerize the voucher payment records for the Chairman's grant as well as official grant close-out procedures.

FY 1987-1989. The Grants and Contracts Management Office will continue to serve the Institute and the grantee community to its maximum capabilities to meet the growth of the programs of the Institute. Its goal is to provide new and innovative approaches to expedite the functions of this office. Increased staff training and interaction with counterparts in other Institutes as well as the grantee community can serve as valuable resources for up-to-date approaches to grants management. Increased interaction of GCMO staff throughout NIH and in the grantee community will be at the forefront of new initiatives, through participation in workshops, seminars, and various membership affiliation meetings involving grants management. This interaction is viewed as an integral part of the growth of the grants management staff to meet the needs of the Institute.

Program Analysis and Technical Information Office (PATIO)

This office is responsible for planning, developing, and managing an NIA scientific and administrative Management Information System (MIS), including database development and management. Program analysis and technical information staff provide a variety of specialized analytical reports concerning NIA policies and programs, as well as information in response to Congressional, other Federal, and public inquiries about NIA research activities. Data are also prepared for regular presentation to the National Advisory Council on Aging (NACA) and the NACA ad hoc Committee on Program. These data concern topics related to extramural program management and review and detail the program and priority score distributions of NIA grant applications. This office also participates in intraagency data processing and database management exchange programs through the NIH Automatic Data Processing/Electronic Processing Coordinating Committee. PATIO provides to the Department, through NIH coordinating offices, information on data processing hardware in use by and planned for NIA, data systems in use by and planned for NIA, and the NIA automatic data processing budget for current and prior fiscal years for all offices including those in Baltimore. PATIO is also responsible for the planning, acquisition, installation, implementation, maintenance, and expansion of computer hardware, software, and related functions.

PATIO is divided into five functional areas: systems design and implementation, data management and reporting, scientific classification, technical information development and analysis, and computer hardware and software management.

Developmental Activities and Achievements, FY 1985

In September 1985, PATIO was transferred to the Office of Planning and Program Analysis in the Office of the Director (OPPA/OD).

a. During FY 1985 the Systems Design and Implementation Group has developed or substantially enhanced several interactive systems for NIA staff:

Fiscal Year Ledger System (FYLS)

This interactive system, which allows GCMO to track NIA paid grants and contracts at four distinct steps in the funding cycle, has been greatly enhanced upon requests from GCMO and the NIA Budget Office. Several new reports were added, some of which link with the central NIH database (IMPAC) system for program codes and other IMPAC information. New fields for tracking full-time equivalents (FTEs), pre- and postdoctoral trainees, former grant number, principal investigator's last name, and administrative supplemental dollars, as well as the ability to distinguish between various types of K07 and K08 awards, were added. New funding activities (Small Business Innovative Research awards and Cooperative Agreements) and dollar amounts in the funding tables were included. Also, additional options for running reports were put in place. A back-up system was established to provide security for both files and reports. These changes were accomplished in addition to PATIO's routine management of this system including changeover of files at the end of the fiscal year, the creation of new files, and changes in allowance levels.

Aging Data Reporting and Evaluation System (ADRES)

Development of ADRES, a menu-oriented interactive system, has been completed. It allows users to run 80 standard reports in various formats and sort sequences against the NIA master files. It also permits users to run a snapshot (a view of all items on a grant record) against both the NIA and NIH databases. Other features, such as updating master files, are available to PATIO staff only. Reports and snapshots may be viewed on a terminal screen, listed at a remote printer, or listed at the computer center. Training of over 35 NIA staff members throughout the extramural offices on the access and use of ADRES was administered by PATIO staff, and documentation was distributed.

Budget Activity Structure (BAS) Coding System

An interactive system that permits the programs to input their own BAS and Program Classification Codes (PCCs) has been developed and is in its final stage of review. Step 1, accessible to PATIO users only, maintains the files and allows updates of BAS/PCC codes assigned to previous grants with the same base number. Step 2, for selected extramural users, prompts the user to print reports of grants, print a sorted listing of codes, or update the codes according to the council date selected. The third step enables the authorized staff member to view or obtain a listing of codes or enter a retrieval action code. The last step submits the dataset of approved grant records for update to the IMPAC files.

In addition, the following two interactive systems were developed to enable staff to respond to requests for information by council members through the Council Data Committee:

High Program Relevance (HPR) System

An interactive HPR system has been developed to allow GCMO to produce a report listing those grants that were given high priority by the previous council. The user is prompted for a particular council date and applicable grant numbers. The program then generates a report listing the grant identification number, principle investigator, institution, project title, amount of award, and start date. The output may be viewed on a screen and printed at a remote printer or at the NIH central printer in one or more copies.

Active File System

An interactive system has been developed to allow GCMO staff to maintain an accurate, up-to-date listing of grants they confirm as "active." The system accesses a frozen file of active grants, created by PATIO upon request, from which staff may add or delete grant records. Staff may request a listing of grant numbers in numerical sequence or produce a report, sorted by program, branch, and section, which is distributed to Council members.

NIA Summary Statement System

A major effort during FY 1985 has been the development of the NIA Summary Statement System, which has been developed as a component of the NIH Division of Research Grants Summary Statement System to produce automated council books at NIH.

SRO keys the summary statements for grant applications to be reviewed at a forthcoming council into the IBM 5520 Administrative System. GCMO keys the budgets for the corresponding grants into the same system, and SRO attaches them to the appropriate summary statements. As summary statements are completed, PATIO and OEA edit them, add the lists of reviewers, and make other minor changes to prepare them for transmission to the Division of Computer Research and Technology (DCRT).

The summary statements are then transmitted through a conversion program from the 5520 System into an IBM PC/XT and then through the DCRT File Transfer Package via modem into WYLBUR data sets. An NIA modification program edits certain features of the statements to make them conform to DRG Summary Statement System specifications, after which they are ready to be picked up by DRG and introduced into the DRG Summary Statement System. NIA prepares an exclusion data set to prepare the appropriate council books for council members who have conflicts of interest with specific applicants. This data set is also picked up by DRG.

At the time NIA is ready to run the first mailing of the council books for GCMO, DRG is asked to run the books using the exclusion list. For councils following May 1985, NIA was required to run the books through the automated system without a manual backup from the NIH print shop. The books and any additional material, such as reports and an index, are printed at DCRT on paper, which is then burst and stripped to provide a finished copy for GCMO to glue-bind and mail out to the council members. NIA adds a one-page index of the summary statements that are found in that mailing. This entire procedure is then repeated for the second mailing.

The remainder of the summary statements for the particular council round are produced in a Special Action Book, which includes a too-late-for-mailing section prepared just prior to council. An additional 6 copies of the complete council books are produced at council time, 4 copies of which are placed on the council table, and 2 copies of which are available to study section members who attend the closed session of the Council meeting.

b. The Data Management and Reporting Group continues to produce standard and ad hoc computer reports for NIA staff and other individuals and groups. This group maintains and updates the BAS/PCC program codes for all NIA pending applications and awarded grants. Members of this group also trained 35 NIA staff members in the use of the interactive ADRES system described above.

c. The Scientific Classification Group has been responsible for maintaining and updating the scientific summaries and codes of all NIA funded grants, including the scientific coding of new NIA grants, according to the Multi-Axis Coding System (MACS). MACS is a system of eleven axes that code grants in terms of scientific discipline, NIH priority area, location and education of the principal investigator, age and type of experimental subjects, materials and methods, and specific scientific content. Detailed scientific summaries of NIA funded grants, prepared under contract, are available for 1978 to 1981. The summary portion of the system is being updated with abstracts of newly funded grants, which are taken from the NIH scientific database (CRISP) whenever possible or are generated by staff from the grant application. Both codes and abstracts can be accessed through an interactive computer system.

d. The Technical Information Development and Analysis Group develops materials for annual requests from other Institutes and groups, including reports on population research, senile dementia, hypertension, diabetes, nutrition, arthritis, biomaterials research, biotechnology, pain and discomfort, liver and biliary tract disease, cancer-related research, minority health, burns and trauma, genetic disease, stroke, and multiple sclerosis. This group has prepared data for such major reports as the Decade of Disabled Persons, Catalog of Federal Domestic Assistance, Rehabilitation of Handicapped Persons, and Inventory for the DHHS Task Force on Black and Minority Health. It has also coded all NIA grants into a prevention/prevention-relevant classification system according to NIH-wide definitions established by the NIH Prevention Coordinating Committee; coded all SBIR applications according to criteria established by the Program Evaluation Branch of the NIH Office of Program Planning and Evaluation; provided data for the annual extramural program reviews; and prepared statistical packages for presentation to the National Advisory Council on Aging. Statistical analyses, including specialized tables of approval rates and priority score distributions for applications to be reviewed by council, analysis of small grants, and trend analyses of appropriations data, have also been prepared.

e. The Computer Hardware and Software Management Group is responsible for maintaining and upgrading the IBM 5520 Administrative Sytem. Maintenace procedures include archiving documents, updating operator profiles, maintaining and updating operations manuals, and managing the system hardware and software. During 1985 the system was upgraded with three new versions of IBM system software designed to add new features and increase the capability of the system. To prepare for a new software version upgrade, all profiles must be archived and other steps taken to insure the integrity of the system documents. Following the upgrade, an IBM engineer must perform a patch operation and then NIA staff must go through a loading procedure for the patch. During 1985, completely new software was provided by IBM, which required archiving all of the documents in the 5520 prior to loading into the system.

Overview of Program Plans, FY 1986-1989

FY 1986.

a. Scientific Database

PATIO staff will conduct a thorough evaluation of the MACS system in conjunction with the NIA Data Users Committee. The original coding system will be examined in terms of new research initiatives and priorities that have evolved since the development of the code in 1981. A system will also be explored to periodically update the abstracts of NIA funded grants with current progress reports.

Program staff has indicated a need to identify applicants requiring animal resources from NIA contractor-furnished animal colonies. PATIO will work with the programs to develop this capability and incorporate it into the scientific database. The Budget Office requires information on NIA support for trans-NIH issues and other Congressional or PHS requests, and these needs will also be addressed.

b. Databases Tailored to the Grants and Contracts Management Office

The Fiscal Year Ledger System (FYLS), initiated several years ago, will undergo enrichment. Grants that have been approved for funding will automatically be added to the FYLS using the funding list produced by AD/OEA. As grants are obligated, the dollar figures will be updated in the FYLS by GCMO. A program to match dollar figures with the NIH IMPAC system will identify discrepancies.

The Consultants File, or Chairman's Grant File, will be implemented in 1986. This file will track the payment of consultants for the review of NIA applications. It will be linked to the SRO file on reviewers to produce the cost of review.

A termination file will be built for GCMO to track the closing process for grantees.

An interactive correction system will be built for GCMO so that corrections to the IMPAC database can be input via WYLBUR datasets instead of using the 901 system. In this way the database will be corrected overnight instead of 7-10 days via interoffice mail.

An interactive council action system will be designed for GCMO so that the council actions can be entered and input directly into IMPAC instead of transmitted via interoffice mail.

c. Initiatives for the Scientific Review Office

A new database will begin operation in 1986 that will identify the reviewers for all grants referred to NIA review committees. Information items such as type of meeting, reason for ad hoc review, and reviewers' names will be contained in this file. It will be built and maintained by SRO and will be used as the base for the Chairman's Grant file for GCMO. The linkage of information of these two files will show the cost of review.

DRG has an interactive system available to the executive secretaries of initial review groups (IRGs) in which the voting information for each IRG can be recorded and the priority score calculated. The system will also allow the input of IRG recommendations and will format the heading information for summary sheets. In 1986 PATIO will assist SRO in using this system so that all review information can be automatically entered into IMPAC by SRO. This procedure will allow the review information to be available overnight and eliminate the current time lag of 7-10 days.

d. New Initiatives for the Personal Computer

PATIO will build a database on the PC to provide inventories of NIA support to respond to requests for information about various trans-NIH issues, i.e., Alzheimer disease, diabetes, nutrition, etc.

PATIO will tailor small files for manipulation on the PC, i.e., center grants, Alzheimer Disease Research Centers, Small Business Innovative Research awards, Small Grants, etc. They will be downloaded from the IBM (DCRT) host and moved into the PC. Software can then be used in the PC to analyze the data or add narrative for report submissions.

PATIO will provide a tracking system for pre-award information on contracts using dBASE III on the PC. IMPAC contains only post-award data on contracts.

PATIO will implement graphics on the PC by using LOTUS 1-2-3 or GIRAPH to display or print out NIA data in the form of bar graphs, pie charts, and trend and regression lines.

e. Other Initiatives

PATIO is working on an automated letter system that will produce form letters via WYLBUR (a text-editing program). Mailing labels, letters, and file copies can also be produced.

A Fact Book for the Fiscal Year will be produced showing expenditure of funds. Various sorts of the information will be presented and will serve as a history of expenditures. PATIO will work with all NIA offices to determine what information displays are required. The Fact Book will be produced at the close of the fiscal year when all dollar figures have been verified (approximately November). The book will also be produced on microfiche as a historical record.

PATIO will investigate the possibility of using Displaywrite III on the PC to process forms automatically. This program can be used to type travel vouchers, training forms, and any other standard forms.

A bibliographic system for the Geriatric Branch was partially developed during FY 1985, and development of the system and query capability will continue in FY 1986.

Planning and Evaluation Office (PEO)

The NIA planning and evaluation function establishes the framework and processes for: the assessment of NIA goals, objectives, and program development strategies; the establishment of research priorities; the consideration of research and administrative support allocations; the formulation and implementation of new programs; and the modification and evaluation of existing programs. NIA planning and evaluation activities are coordinated with NIH-wide processes and policies through this office.

Developmental Activities and Achievements, FY 1985

In January 1985 the NIA planning and evaluation functions were transferred to the Office of Planning and Program Analysis, under the direction of the NIA Deputy Director. Concurrently with this reorganization, the NIH Office of Planning and Program Evaluation (OPPE) was undergoing a management assessment so that no major changes in the Institute's planning and evaluation processes occurred at either the NIH or NIA level during FY 1985.

However, certain procedural changes were implemented in response to the recommendations of the NIA Resource Allocation Work Group. These recommendations were based on the Work Group's conclusion that decisions about resource allocation must be directly tied to decisions about research priorities. The first modification provides an opportunity to establish consensus on NIA research priorities among all Institute staff at a Pre-Sourcebook Planning Session. This meeting will be held annually in September and attended by the Director and Deputy Director, extramural and intramural program staff, and representatives of all administrative offices. During this session the NIA Director and staff will discuss and adjust the Institute's three-year plan, determine areas of high priority, and assess the impact of evolving NIA programs on aging research and on NIA resources. These discussions will be followed by decision memorandums from the Director, to be used as the basis for the development of sourcebook material as well as the submission for the annual planning session with the NIH Director.

Because the FY 1985 session was not held until mid-February, the function of this meeting was limited to 1) review of the status of NIA research initiatives, 2) refinement of FY 1986 priority areas as presented to Dr. Wyngaarden in November 1984, and 3) discussion of potential FY 1987 priority areas. Following this meeting a list of "Proposed NIA Research Priority Areas," including modifications for FY 1986 and recommendations for FY 1987, was drawn up and distributed to all programs and offices. At the FY 1986 Pre-Sourcebook Planning Session held in September 1985, the Director and Institute staff updated this list and selected areas of high research priority for fiscal year 1987 for inclusion in the briefing document for the review session with the NIH Director scheduled for January 1986.

A second change recommended by the Work Group resulted from the need for administrative staff to assess the impact of program plans on their workloads before they develop their sourcebooks. Therefore, the schedule for sourcebook submissions and subsequent program reviews was staggered, with the extramural programs first, the administrative offices next, and the intramural programs last.

The intramural planning schedule is dictated to a large extent by the submission of an annual report late in the fiscal year, and it is, therefore, more efficient for the intramural programs to prepare their sourcebook material concurrently with these annual reports. In order to provide the Director with a preliminary picture of the Institute's intramural plans, priorities, and resource needs early in the cycle and to give the Institute's administrative staff an indication of intramural plans that may have an impact on their planning activities, the Work Group recommended a third modification in the planning process. The intramural programs will present an overview o their program initiatives for future years to executive staff in the spring each year. In FY 1985 these presentations were made in April to coincide wi the extramural program reviews. Regular comprehensive intramural program reviews were held at the beginning of September.

During the year, PEO staff also reviewed descriptions of planning processes other Institutes. These descriptions had been prepared under contract and were made available to all NIH staff through an automated system maintained the Program Planning Branch in the Division of Program Analysis, OPPE. Unfortunately, among the Institutes, summaries were only completed for NIA, NIAID, NICHD, NIADDK, and NINCDS. The system also includes summaries for th OD/NIH, DRG, FIC, DCRT, DRS, and NLM, but they are not as relevant to the NI planning function. According to OPPE, the missing summaries will never be added to the system. However, the ones that are available provide interesti comparisons to the process followed by NIA, as well as some activities that might be considered for incorporation in the NIA process.

The Institutes also touched on the development and update of their long-rang plans, which are comparable to the NIA National Plan for Research on Aging. However, these activities tended to focus on evaluations of research conduct and supported by the Institutes and could not be adopted by the NIA without modification since the NIA mandate requires coordination of long-range planning in all areas of aging research at the national level.

A major ongoing responsibility of the PEO is the conduct of the annual program reviews and includes development and distribution of instructions for preparation of the NIA sourcebooks, scheduling of review sessions between the NIA Director and program offices, and management of follow-up activities to implement decisions reached at these sessions.

Only minor revisions were made in the sourcebook instructions this year, the most significant of which was a request to flag international activities in the margins of the text to facilitate the collection of this information. A the end of FY 1985, PEO held a meeting with representatives of the extramura programs to review the instructions and revise the reporting requirements to make them more concise and less time-consuming.

The program reviews were held on the new staggered schedule, with the extramural program presentations in May, the administrative offices in June, and the intramural programs in September. Instead of formal minutes, PEO staff recorded only major issues raised during the reviews, and program staf noted changes to be made in the sourcebook material, based on the outcome of the discussions. PEO staff compiled action items from each review and followed them up with appropriate meetings to obtain additional input from staff. The specific policy issues generated by the FY 1985 program reviews were (1) annual allocation of set-aside funds, (2) distribution of research contract funds among the four research programs, (3) Institute support of research resources, and (4) establishment of separate extramural program budgets. Policy statements are being prepared on each of these topics.

Follow-up meetings were also arranged by PEO to discuss proposed Requests for Applications in selected research areas and proposed conferences and workshops in areas of current program development. PEO drafted decision memorandums for the NIA Director based on the outcome of these meetings.

Another ongoing responsibility of this office is the management of the annual extramural program reviews by the National Advisory Council on Aging. In preparation for these reviews, sections of the sourcebooks were sent to Council members to serve as background material for the verbal presentations, which were made at the September Council meeting. A meeting has been set up with extramural staff to revise this process so that the reviewers have more time to prepare their evaluations and the Institute obtains better documentation of the reviewers' recommendations.

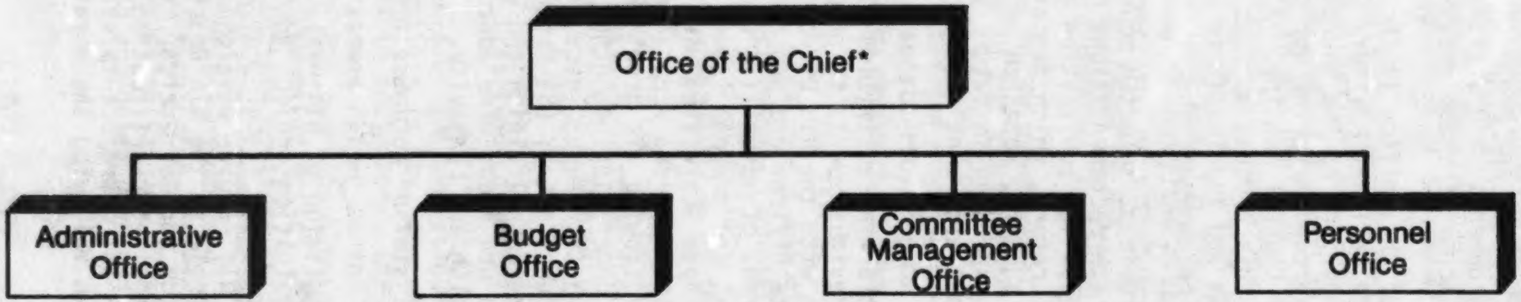
Upon completion of the Council reviews, selected sourcebook material was revised as necessary to incorporate recommendations made by the Council and then updated, edited, and assembled for publication as the Seventh Report to Council on Program. This annual report, which describes extramural program objectives and current areas of support, research advances for the past year, and anticipated development and expansion in future years, is not only distributed to Council members but also sent to selected members of Congress and the scientific community.

PEO also coordinates Institute planning activities with NIH and Departmental planning requirements. As in previous years, it prepared materials for the NIA Director's planning sessions with the NIH Director, held in November 1984. Based on input from all Institute offices and programs, a document was developed concerning high priority areas of scientific opportunity to be funded under the 1986 President's Budget and program issues likely to be raised at the appropriations hearings. (These activities were completed before the reorganization.) Eight high priority areas were selected for the fiscal year 1986 submission, including the following six areas from the previous year, with appropriate updating: (1) Understanding Aging; (2) Molecular Genetics of Aging; (3) Alzheimer Disease/Dementia/Neuroscience; (4) Strategies for Promoting Health and Effective Functioning; (5) Extending the Research Base in Geriatrics; and (6) Enhancing Research Training and Career Development in Geriatrics and Gerontology. Two new areas were added: (7) The Oldest Old; and (8) Effects of Gender on Health and Longevity.

PEO coordinated preparation of a similar document for the planning session to be held in the winter of FY 1986.

This office also manages the submission of NIA evaluations based on documentation prepared by the evaluation project administrators. No new projects were proposed by NIA staff for fiscal year 1986 so the Institute submitted one ongoing project: NIA Program Development in Alzheimer Disease Research. A second evaluation project, the NIA Research Training and Career Development Program in Gerontology and Geriatrics, has been of continued interest to the Institute but requires clarification of some administrative issues before work can begin. A third project to evaluate the Institute's small grant program was withdrawn following the moratorium placed on this mechanism.

Office of Administrative Management



*Also serves as Executive Officer, NIA.

6/7/84

OFFICE OF ADMINISTRATIVE MANAGEMENT (OAM)

The Office of Administrative Management is responsible for advising the Director, Deputy Director, and other Institute officials on managerial and administrative matters affecting the planning and execution of Institute programs; interpreting, analyzing, and implementing Departmental administrative and management directives; developing policies on administrative management and issuing procedures and guidelines for implementation of these policies; and providing coordinating, supporting, and staff services in the areas of fiscal management, personnel management, committee management, and administrative services. These responsibilities are carried out through the Budget, Personnel, Committee Management, and Administrative Offices. The OAM is headed by the Executive Officer, NIA, who serves in a dual capacity.

Selected Program Activities in FY 1985

Management Assessment. During the earlier part of FY 1985, the OAM has been involved in the final stages of the NIA Management Assessment Study, which was carried out during the previous year with assistance from the Division of Management Policy, NIH. Through the Management Assessment Study Advisory Committee, reports and recommendations were developed for the five major areas identified by the study as needing increased attention. These areas are: Awards and Recognition, Communications, Resource Allocation, Training, and Working Relations. Several of the recommendations contained in these reports have been implemented. OAM staff is currently involved in the review and implementation of the remaining recommendations.

Integrated Communications System (ICS). A general recommendation that resulted from the Management Assessment Study concerned the need for a better communications system for the Institute. A study for a computer-based integrated communications system was completed by DCRT late in 1984, and a report was received in January 1985. This report recommends that the Institute install a number of IBM PCs that are linked together through a local area network. Under this proposal, every component of the Institute, including the Intramural Research Program located at the Gerontology Research Center in Baltimore, the extramural and administrative offices in Building 31 and the Laboratory of Neurosciences in Building 10 on the NIH campus in Bethesda, and the Epidemiology, Demography, and Biometry Program in the Federal Building in downtown Bethesda, will be included. Planned use of the ICS includes a broad range of applications from office automation (word processing, calendaring, and electronic mail) to program and office management. It will also access a broad variety of computer files, e.g., the NIA ADRES system, MEDLINE, TOXLINE, etc. A major requirement related to the implementation of the system is user training. The NIH Division of Personnel Management assisted in identifying necessary training and has provided it for Institute staff. DCRT is continuing to assist in system design and installation. It is anticipated that the installation phase of the project will be completed by March 1986. Further development, expansion, and modification will continue into FY 1987.

OAM staff also assisted in a reorganization of NIA that resulted in the establishment of an Office of Extramural Affairs, which now includes the Scientific Review Office and the Grants and Contracts Management Office, and an Office of Planning and Program Analysis, which includes the Planning and Evaluation Office and the Program Analysis and Technical Information Office. The primary purpose of this change was to move the planning and program analysis function closer organizationally to the Office of the Director. In addition, staff has also been involved in a reorganization of the Intramural Research Program in Baltimore, which included the establishment of several new laboratories and sections and modifications to others.

Another activity involved arranging for an architect/engineering firm to assist the Institute in reviewing the use of its assigned space in Building 31 and recommending how this space can be better utilized to improve Institute operations. The data gathering phase began in May 1985, and the firm has met with key Institute staff to gain additional information about the operations of the Institute.

Personnel Office. During the past year, the Personnel Office has successfully initiated a Personnel Seminar Workshop series. It has conducted (in both the Bethesda and Baltimore locations) workshops on awards, adverse actions, merit promotion, the Employee Performance Management System, and counseling and career development. Each of these workshops was well received by Institute staff. It is anticipated that this workshop series will continue into the next fiscal year.

During the year the Personnel Office recruited and placed a large number of clerical and technical support staff, particularly within the Bethesda component of the Institute. Despite the paucity of qualified candidates for these types of positions, in most cases replacements were identified and placed with minimal disruption to program and office operations.

The Personnel Office also developed a unique orientation program for new employees of the NIA. The initial pilot orientation program was conducted in February 1985 and involved staff from both Bethesda and Baltimore. The program is currently being evaluated for possible modification and expansion to all NIA employees.

Budget Office. The Budget Office continued to improve the provision of financial management services to the Institute. Two areas were particularly difficult during this period. The first involved a change in the already enacted FY 1985 appropriation during the development of the FY 1986 budget. This change required extensive work on the development of plans related to how the Institute would operate under this directive.

The second area involved a reduction in the allocation of full-time equivalents (FTEs) for NIA for FY 1985 and FY 1986. These reductions, from 367 to 356 in 1985 and to 348 in 1986, have required an extensive personnel analysis during recent months. The Budget Office has been instrumental in providing a large amount of information and options to the Director and Deputy Director on how best to achieve these reductions.

Finally, as a result of the recent reorganization, the Budget Office has assumed the legislative liaison function for the NIA. Legislative and budgetary activities have many common interests and will benefit from the combination of the two responsibilities.

Committee Management Office. This office continued to provide administrative and technical support for the operation of NIA's four advisory committees: the National Advisory Council on Aging, the Board of Scientific Counselors, the Aging Review Committee, and the Geriatrics Review Committee. The 16 members of the Geriatrics Review Committee, which was approved in June of last year, have been appointed, and the Committee is operational. Charters, reports, and nomination slates for all four of these committees were completed during the year.

Administrative Office. During FY 1985 the Administrative Office has continued to provide a broad range of administrative services to the programs and offices of the Institute. It has issued updated instructions for processing requests for approval of international travel. Staff has participated with other Institutes in the development of a procurement action for the acquisition of logistical support services for conferences and workshops. In addition, the Administrative Office carries the major responsibility for the development and implementation of the NIA ICS and participates on NIH task forces and committees related to office automation.

Plans for FY 1986

As stated in program reports for previous years, the activities of the Office of Administrative Management derive from requirements generated by the various offices and programs of the Institute. Therefore, with some exceptions, it is not possible to identify the specific activities that will be required of OAM staff for the next fiscal year. There are several major activities and projects, however, that will surely require OAM involvement. A large portion of its effort, in collaboration with staff of other NIA offices and programs, will be devoted to the implementation of the Integrated Communications System, including acquiring the hardware and the software, setting up the equipment, training the users, and further developing the system. There are several high-level positions for which recruitment will take place over the next six to twelve months, and the Personnel Office will devote substantial effort to this time-consuming process. Continued efforts will be directed toward further computerization of financial and other management data and the necessary coordination between the Office of Administrative Management and the Program Analysis and Technical Information Office. The normal functions related to the ongoing maintenance of the Institute's advisory committees, including rechartering and developing slates, etc., will also be carried out.

Administrative Office (AO)

The Administrative Office is the focal point for Institute staff for a variety of activities, including office automation, administrative policy and procedures, procurement, travel, maintenance, mail delivery, copy machines, telephones, consultant services, directories, property, and management advice on administrative matters. The activities are generally performed for the Bethesda component of the Institute; however, some activities are performed for the Intramural Research Program in Baltimore.

Developmental Activities and Achievements, FY 1985

Travel. The Administrative Office routinely processes domestic travel orders and vouchers, initiates international travel paperwork, and completes all travel activities for the Director and Council members. A monthly status report on travel funds is prepared and distributed to program administrators. A status report on requested and approved international travel is also prepared in order to monitor international travel. In addition, the AO prepared and distributed updated guidelines for responsibilities and minimum timeframes for processing paperwork to obtain approval for international travel (including Canada and Mexico).

Procurement. Realizing that considerable staff time is spent on preparing for conferences and workshops, AO staff participated with representatives from other Institutes in the review of proposals for logistical conference support that would set in place basic ordering agreements to expedite procurement of these services.

Office Automation. The Institute uses several different types of equipment for word processing and data processing. The IBM PC-XT has also been introduced in several offices during the past year. An Integrated Communications System is being implemented to network NIA's office automation activities. AO staff is involved in several NIH-wide task groups dealing with office automation. An Acquisition Handbook for Office Automation Equipment has been drafted and will be available to NIH administrative staff to facilitate planning and procurement of equipment. Committees have been formed in several areas of interest, such as networking, classification, and inventories, in order to provide a resource network for administrative staff. The Administrative Office has participated in the NIA Lead User Group, which has been trained in basic microcomputer operations and in software applications, such as word processing, telecommunications, and data management. This training will continue for the next year.

Ergonomics. Ergonomics has two principles: fitting the person to the job and fitting the job to the person. The AO has made a considerble effort to improve ergonomic features in the workplace. This activity is important in achieving higher-quality performance and significantly enhancing employee job satisfaction. One of the most difficult items to procure is a well-designed chair. Steps have been taken to obtain a waiver from the General Services Administration (GSA) to obtain chairs that are adjustable and comfortable. Anti-glare screens have been installed on the PCs and word processors. The NIH Division of Safety is planning to issue an "Ergonomic Handbook" and reference materials. The Administrative Office is participating in the review of these materials.

Mail/Publication Distribution. The Administrative Office has assisted the Information Office with its mail and publication distribution and completed the mailout of 1,000 copies of Normal Human Aging: The Baltimore Longitudinal Study of Aging. The Office also stocks and maintains the publications display on the second floor for the Information Office.

Requests for reports on procurement, travel, the property inventory, conferences, consultant services, A-76, the Information Collection Budget, staffing and organization charts, employee suggestions, organizational changes, and more are completed by the Administrative Office staff with little disruption to Institute staff. Various coordinating activities are performed by the Administrative Office for the Intramural Research Program due to its physical separation. The office is also involved in the orientation of new staff, processing personnel actions, and processing certain intra/interagency agreements and Intergovernmental Personnel Assignments.

Overview of Program Plans, FY 1986

During the next year, the AO will be actively involved in the installation of the IBM PC-XTs and ATs, including assembling the equipment, installing various memory and function boards, loading the software, and placing the equipment. Several activities will be undertaken to facilitate this transition. Furniture and workstations will be procured in order to place the microcomputers in the offices. A glossary of office automation and microcomputer terms will also be prepared to assist staff.

Budget Office

The Budget Office is charged with full responsibility for the formulation, presentation, and execution of the Institute's budget. This office serves as the principal advisory body within the Institute for general NIH budget policy based on guidelines furnished by the NIH Division of Financial Management (DFM) and on financial analyses and studies conducted by the office itself.

Formulation, the development stage of the budget, starts at the NIH level and goes through channels to the Department. At each stage, the Institute receives a budget level that is the basis of the justification going to the next highest level. From the Department, the budget is presented to the Office of Management and Budget (OMB) and finally becomes the President's budget. It is then submitted to Congress. Presentation of the budget is the formal hearings process in which the Institute Director justifies and explains the Institute programs to the House and Senate Appropriations Subcommittees. As a result of these hearings, the NIA receives an annual appropriation, which leads into the final phase of budgeting, the execution phase. Execution is the development of resource allocation plans based on program requirements and the tracking of obligations to assure full and appropriate use of Institute funds.

Developmental Activities and Achievements, FY 1985

Formulation and Presentation. The Budget Office is the focal point for Institute budget planning. As such, it formulates budget projections as far as two to four years in advance. A key element in development of accurate projections for future years is input from program staff - through the annual program reports and through regularly updated information concerning ongoing and projected program activities, program priorities, and research areas of high priority to the Institute.

In FY 1985, the Budget Office prepared all standard budget tables for each phase of the FY 1986 budget process. It also prepared the Director's opening statement to Congress; answered and coordinated responses to questions to be answered for the record for both Senate and House Appropriations Subcommittees; prepared numerous narrative justifications; and developed a professional judgment budget. The Budget Office responded to all budget-related questions, coordinated both its own responses and those provided by program staff, revised answers as necessary, and assured both completeness of response and uniformity of format. The FY 1987 preliminary budget was submitted to the Public Health Service (PHS) for review. This budget consisted of three different possible funding levels, each with its own budget assumptions, and was in effect three different budgets.

The computerized aspects of the budget formulation process are functioning smoothly. The on-line capability with PHS, first introduced last year, has substantially reduced the amount of time required to modify various technical schedules as budget assumptions change over the course of the formulation process. A template developed and refined by Budget Office staff for the NIA Extramural commitment base was adopted by the Budget Formulation and Presentation Branch, DFM.

A recent innovation has been the introduction of a legislative liaison function with the NIH Division of Legislative Analysis. Legislative activities and budget activities not only have much in common, but frequently are overlapping in nature. It is expected that both functions will benefit from this close association.

Execution. The Budget Office continues to monitor the monthly status of personnel and operating funds. Reports are prepared monthly for program heads to be used in their planning for staff and program activities. Close coordination is maintained with program staff and the NIA's Administrative Office to ensure the most appropriate use of funds. The status of extramural funds is monitored through the fiscal ledger maintained by the NIA's Grants and Contracts Management Office. The Budget Office is monitoring extramural funds more closely because of recurring reports that are now requested by the OMB to identify obligation patterns and estimate expenditures more precisely.

Due to the continuing reduction in the FTE ceiling, this office has played a major role in monitoring FTE usage and advising the NIA Director on various options for conserving FTEs. At the beginning of the fiscal year, an employment plan was prepared that indicated how the NIA would utilize FTEs throughout the year. Monthly reports are prepared for the NIH central budget office reflecting how well NIA is following its plan and working toward its FTE ceiling. In addition, a number of special analyses have been prepared for the Director and have led to the assignment of an FTE ceiling for NIA programs and offices.

The Budget Office has continued to work on a computerized database of historical NIA budget material. When completed, it will include year-by-year information on numbers and kinds of research and training awards made, as well as the number of full-time trainees supported; the number of contracts supported; and dollars associated with these mechanisms. Software has been developed that will allow manipulation of the information contained in the database. Projected uses include analysis of growth rates and funding trends, future-year projections based on analysis of past experience (especially valuable for the formulation of outyear budgets), and as a base for development of alternative approaches to extramural funding policies, especially in years of limited resources. The database will also provide Institute-generated data that can then be compared with material developed by the NIH Division of Research Grants and DFM to ensure that NIA interests and needs are being met. In the future, the database will be expanded to include trans-NIH issues, programmatic information, and information on intramural research and research management and support.

Overview of Office Plans, FY 1986

The Budget Office will continue working closely with the Program Analysis and Technical Information Office (PATIO) to ascertain the best and most appropriate way to obtain various reports and data information for which the Budget Office has recurring requests and to determine different types of analyses that need to be done. It will also work with PATIO to develop a computer-generated list of the discrepancies that occur between data in the NIH database and data in the fiscal ledger to facilitate verification of obligations and future-year commitments.

Plans are being developed to transfer employment data from Budget Office files to the IBM personal computer. A database will be set up that will enable the Budget Office to monitor the NIA FTE ceiling more closely and to project total usage by fiscal year more accurately. In addition, the information contained in this database will provide a source for special analyses that may be performed through the year.

Development of a fact book for FY 1984 has been delayed for technical reasons. The office anticipates, however, preparing a fact book for FY 1985 actual data, which will be useful for the Budget Office and for the Institute as a whole. The fact book will include such categories as funding trends, employment trends, and overall spending patterns.

A base of historical NIA budget material for extramural activities has now been computerized. A separate database has been developed for trans-NIH issues such as arthritis, biotechnology, hypertension, senile dementia, etc. In 1986 the office will begin developing ways to manipulate the information contained in these databases. Projected uses include trends analysis, future-year projections, and development of alternative approaches to extramural funding policies. Preliminary discussions have been held with DFM concerning the possibility of establishing an on-line computer communications capability with the NIH central budget office prior to the next budget formulation cycle. Plans are also being made to computerize more of the documents and tables standardly required by the budget formulation process and to begin computerizing briefing materials for budget hearings.

Committee Management Office (CMO)

The Committee Management Office is responsible for all administrative procedures concerning the public advisory groups that serve the Institute, the National Advisory Council on Aging, the Aging Review Committee, the Board of Scientific Counselors, and the Geriatrics Review Committee.

The CMO performs administrative steps for the nomination and selection of outside consultants to advisory groups and maintains a file of nominees proposed by special interest groups, Congress, and other sources. Recommendations are made to the Director from this file based on the CMO's determination of candidates' eligibility and availability, as well as assessment of the composition and needs of the committee. The CMO assists the Director, Deputy Director, the Executive Staff, the NIH Committee Management Office, and the Department in negotiating appointments. After candidates receive final approval and formal letters of invitation and acceptance have been exchanged, an orientation is scheduled for new members to provide background on NIH and the Institute necessary for the performance of their advisory tasks. New members are also informed of laws and regulations governing their appointment and service, standards of conduct, and regulations pertaining to committees and councils. Records are maintained by the CMO on all committee personnel and committee actions.

The CMO is responsible for coordination and supervision of necessary administrative procedures within the Institute to assure compliance with Conflict of Interest statutes by all committee members serving the Institute. Declarations of financial interests and private employment forms are reviewed, and appropriate program officials are notified when a consultant should be prohibited from participation in a specific activity due to possible conflict of interest.

The CMO prepares statements concerning the legal authority for committee establishment, structure, function, and operating procedures. It also prepares the charter and supporting documents, including current and estimated operating budgets, which are then forwarded through the CMO/NIH to the Office of the Secretary, Department of Health and Human Services (DHHS), for approval of charter establishment or renewal.

The CMO is responsible for the preparation and submission of all required reports on advisory committee activities, including changes in committee membership, structure, function, composition, or charter, as well as Institute participation on other Governmental committees. It also responds to inquiries from both within and outside the Institute concerning advisory group functions.

Arrangements for advisory council meetings are handled by the CMO, including scheduling, notifying participants and attendees, reserving conference facilities, filling requests for verbatim transcript and parking permits, and securing travel and hotel accommodations. The CMO prepares and submits notices of meetings to the Federal Register in compliance with the provisions of the Federal Advisory Committee Act.

A tentative agenda is drafted for each council meeting, with input from members and staff, and a special annotated agenda is assembled for the Chairman's use during the conduct of the meeting. The CMO prepares letters of invitation and thank-you letters for the Director's signature.

After the meeting, the CMO prepares and distributes minutes of the proceedings to members and the public and forwards resolutions to the Director, NIH, and/or the Secretary, DHHS.

Developmental Activities and Achievements, FY 1985

During FY 1985, the CMO prepared documents to recharter three of the NIA's four public advisory committees. Because the Department requires cost information for operating Federal advisory committees, detailed financial operating plans were prepared and submitted with the formal rechartering documents. The financial operating plans include the actual and projected committee operating costs.

Approval to establish the Geriatrics Review Committee was received from the Secretary, DHHS, in June. The CMO prepared a nomination slate of sixteen members to serve on this Committee. When the slate was approved, letters of invitation and appointment forms were prepared for each member.

The CMO prepared nomination packages for the Aging Review Committee and the Board of Scientific Counselors. These nomination packages were submitted to the Director, NIH, for final selection.

This office is currently in the process of preparing a slate of nominees to fill six Council vacancies. When the slate is completed and cleared through NIH, it will be forwarded to the Secretary, DHHS, for final selection.

The CMO responded to inquiries from NIH, Congress, the Department, and public interest groups concerning authority, composition, specific requirements, functions, and operating procedures of NIA's public advisory groups. The following reports were completed by the CMO during FY 85: the quarterly female and minority reports, a General Services Administration report, an annual report, and an annual comprehensive review.

Overview of Office Plans, FY 1986

The activities of the Committee Management Office are, for the most part, repetitive, and it is therefore difficult to anticipate new activities.

However, routine activities will continue to be performed in order to ensure the effective operation of the NIA's public advisory committees.

Personnel Office

This office is responsible for providing a full range of basic and proactive personnel services. These services include the operation of a sound position classification and position management program, a staffing and recruitment program, a labor relations program, and an employee relations program, which includes employee counseling, adverse action and grievance responsibilities, associated advisory services to management, and equal employment opportunity responsibilities.

Carrying out these responsibilities requires extensive interaction between members of the Personnel Office staff and managers, supervisors, employees, Offices of the Division of Personnel Management, NIH, PHS, and DHHS, and a variety of organizations outside of the Department, including the Office of Personnel Management.

The Personnel Office's role is to provide the management staff and employees of NIA with a variety of personnel services while meeting its regulatory obligations. Because of the importance of direct day-to-day interactions with supervisors and employees in both the Bethesda and Baltimore components, the Personnel Office provides its services with a staff that is divided physically between the Baltimore and Bethesda locations. This arrangement is unique at NIH, and although staff coordination problems sometimes occur, the increased level of service provided to program areas more than offsets these problems. The Personnel Office is the only office within the NIA that operates with this geographic dispersion of its staff.

Developmental Activities and Achievements, FY 1985

This past year represented one of the most active years for the NIA Personnel Office staff in the history of the Institute. In addition to the initiation of important new programs, the Personnel Office had a greatly increased volume of normal actions due to an unusually high turnover of NIA personnel, increased activity generated by the Management Assessment Study, and staff shortages that affected the normal staffing level of the Personnel Office throughout most of the year.

A surprisingly higher-than-expected level of activity was generated by the staffing and recruitment program this past year. A total of 26 clerical and technical support persons were lost from the Bethesda offices alone. This number of positions is somewhat high given the Bethesda staff size and generated a tremendous amount of activity in terms of recruiting for and filling each of those positions. The problem was further complicated by the fact that recruitment in general for clerical support personnel has become very difficult within the Federal sector, and even routine recruitment actions often involve multiple advertisements and review of a large number of applications. In addition to the extensive recruitment program, the Personnel

Office coordinated the search for and successful filling of the position of Deputy Director, NIA, well ahead of the anticipated schedule.

The Personnel Office also exercised proactive initiatives that involved placement of individuals in jobs within the Institute and demonstrated one of the first uses at NIH of the Career Opportunities Training Agreement to place an NIA clerical employee in a newly established program analyst position.

The second major initiative undertaken by the Personnel Office in FY 1985 was to bring the Personnel Seminar Workshop series to fruition. Workshops were conducted in the following areas: awards, adverse actions, merit promotion, the Employee Performance Management System, and counseling and career development. Each of these sessions required extensive staff development time on the part of the Personnel Office and coordination between the Bethesda and Baltimore offices. They were generally considered informative and useful by NIA staff.

A third area of activity that emerged somewhat unexpectedly involved the employee relations program. These activities, while they do not often show up statistically, can be very time-consuming. A single action to remove, suspend, or downgrade an employee may require extensive work on the part of the personnel management specialist over a period of several months to properly develop the case and bring it to a successful conclusion. Last year the Personnel Office had three major cases, two of which were official actions taken to remove, downgrade or suspend an employee, and one of which resulted in an early retirement.

Another major area of activity, as always, involved the position classification and position management program. Several important promotions were made that involved considerable analysis and discussion, both among Personnel Office staff and between Personnel Office staff and management. In addition, the Personnel Office made innovative classifications to address the needs raised by the Management Assessment Study by establishing bridge positions within NIA.

The final area of accomplishment in FY 1985 involved the establishment of a comprehensive training program within the NIA. This initiative, begun at the very basic level in the previous year, began to pay dividends this year with the coordination of support staff training, the development of a computerized tracking system for training, the seminars and workshops previously mentioned, and most important, the development and implementation of the NIA orientation program, which was piloted and is currently being evaluated for further development. All of these activities were highly successful and had an important impact on the overall management of the Institute.

Overview of Office Plans, FY 1986

In FY 1986 a major area of consideration will be the development of the NIA orientation program to include all employees of the Institute. If it is agreed to proceed with such a program, it will require a restructuring of the orientation program and a major coordinating effort on the part of the Personnel Office to include the entire Institute in the performance development program.

OFFICE OF PUBLIC INFORMATION (OPI)

This office is responsible for planning, coordinating and carrying out a [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Program Areas [illegible]

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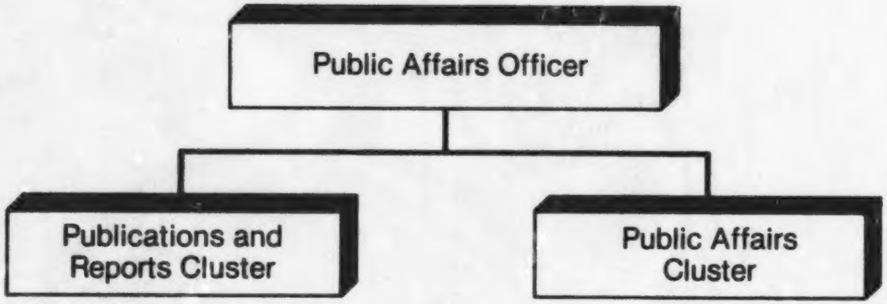
Office of Public Information



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OFFICE OF PUBLIC INFORMATION (OPI)

This office is responsible for planning, organizing, and carrying out a congressionally mandated public information and health education program on aging and the needs and problems of older people that is responsive to the interests of the general public, mass media, special interest groups, government agencies, and local organizations, all of whose attitudes and needs have an important bearing on the accomplishment of the NIA's mission. Since 1976, the OPI has played an integral role in the planning and execution of campaigns in support of such institute priorities as Alzheimer disease, geriatric medicine, and the older woman.

The office is organized into two clusters--Public Affairs and Publications and Reports. Their responsibilities are as follows:

The Public Affairs cluster plans and executes multi-media health education and publicity campaigns in support of the NIA's congressionally mandated responsibilities in this area. These responsibilities are accomplished through the production, promotion, and dissemination of materials to the general public and special interest groups using all types of media, including radio, television, newspapers, magazines, professional and scientific journals, still and motion pictures, posters, exhibits, and advertisements.

The Publications and Reports cluster is responsible for the development of written materials such as annual reports and bibliographies, research highlights, special projects for Congress, brochures, and fact sheets intended to communicate accurate and useful information about the programs, interests, and achievements of the NIA.

Selected Program Activities in FY 1985 and Plans for FY 1986

Press Activities

In an effort to deliver sound health information to an ever-widening audience--while at the same time preserving precious resources--the OPI continued to expand its interactions with medical, scientific and general assignment reporters. As an example, one particularly successful press activity planned and executed during the past year is described below.

In May 1985, the OPI sponsored a special press briefing on "Life Extension: Fad, Fact or Fiction?". The Institute's Deputy Director spoke to a standing-room-only crowd of approximately 30 reporters representing major daily newspapers (such as the Washington Post, the Los Angeles Times, and the London Observer), several radio networks and major news services (including CBS, NBC, National Public Radio, Mutual Radio Network, Voice of America, Physicians Radio Network, and Medill News Service), along with representatives of the medical and aging press (such as U.S. Medicine, Medical Tribune, and Modern Maturity). In the weeks following the conference, stories appeared on the UPI wire, the Times-Post News Service, and network radio, and some 50 additional inquiries were received by this office. More than a month later, OPI still continued to receive at least one press call each day, including a request for a special interview "spread" in U.S. News and World Report.

This briefing was one of the most successful press efforts ever sponsored by the NIA, largely because it combined all of the elements necessary for good press. The topic was newsworthy because of the high level of public interest and the suggestion of controversy created by conflicting opinions. The newsworthiness was further supported by simultaneous publication of an important review article in the New England Journal of Medicine. The topic was broad enough to appeal to the various types of reporters with whom the Institute deals. (Science writers were interested in immunologic interventions in animal studies. Medical writers focused on what their readers can do to stay healthy. General assignment reporters focused on what the government is and is not doing to stop medical quackery.) Finally, scientific staff was fully cooperative with OPI staff and provided the information needed to plan a press conference well in advance of the publication in the New England Journal of Medicine.

OPI's goal is to schedule at least one large briefing next year (possibly on the topic of "Theories of Aging" or on "Coping with Your Aging Parent") as well as a science writers seminar on "How a Man/Woman Ages."

Alzheimer Disease

Once again, this year's activities in the area of Alzheimer disease represent the broad range of OPI's interests and accomplishments. During the past year, OPI staff helped coordinate a successful national conference on clinical nursing and Alzheimer disease (from the early planning stages to publication of the proceedings in the Journal of Geriatric Nursing); was on top of national media coverage of several "breakthroughs" that converged in the late summer (including NIA's own announcement of findings at Harvard Medical School as well as more questionable publicity surrounding a supposed new "cure" for Alzheimer disease); helped plan and provided research resources for a Newsweek cover story on Alzheimer disease; arranged local media coverage for NIA's five new Alzheimer Disease Research Centers (and provided specially designed videotapes, charts and photographs to each of the centers for their press conferences); worked with the Alzheimer's Disease and Related Disorders Association (ADRDA) as it planned for its first international meeting; and worked with the Secretary's Task Force on Alzheimer Disease (both as the Institute's representative on the subgroup on information dissemination and as a focal point for data and information requested by the Executive Secretary of the Task Force). All this was done in addition to PIO's regular activities in the area of Alzheimer disease--answering several thousand press, public, and congressional inquiries; researching, writing, and editing both lay and technical discussions of Institute activities in this area; representing the Institute's interests in dementia at major scientific and medical meetings; and acting as the Institute's liaison to the ADRDA.

Osteoporosis Information Efforts

The Institute has been increasingly active in disseminating information on osteoporosis to the general public. Since the inception of the NIA in 1974 the climate for health information on aging and the special problems of the aged has changed drastically. Today there is an ever increasing demand for such information as people take on a greater role in maintaining their own health. This is most certainly the case with respect to osteoporosis.

The NIA regularly receives both press calls and general requests for information on osteoporosis, its treatment and prevention. In response, the NIA issued an Age Page--a widely acclaimed, simply written, one-page fact sheet called "Osteoporosis: The Bone Thinner." Over one million copies of these Age Pages were distributed in bulk quantities in supermarkets, in pharmacies, and through state and area agencies on aging, as well as in response to inquiries directed to the Institute. Many small town newspapers and senior citizen newspapers picked up this material and made it available to their readers. The material also appears in 750,000 copies of Help Yourself to Good Health, a joint publication by the Institute and Pfizer Pharmaceuticals. Information on osteoporosis is also available in NIA's prize-winning publication, "The Menopause Time of Life." Specialized news services such as the NIH News and Features and the NIH Search for Health have carried stories written by OPI staff on research on osteoporosis. A specially formatted release on osteoporosis to be used in syndicated columns has generated approximately 460 newspaper articles with a combined circulation of 2,369,240 in suburban and rural areas.

Recently the Age Page has been revised to reflect a more aggressive approach to the prevention and treatment of osteoporosis. The new Age Page was part of a cooperative effort between the American Association of Retired Persons (AARP) and the NIA. AARP has made the Age Page, as well as more lengthy literature on osteoporosis developed in cooperation with the NIA, available to its extensive membership as a part of its "Osteoporosis Awareness" campaign. AARP has also made its literature available in quantity to the Institute for inclusion in regular responses to inquiries.

In 1984, congressional legislation was introduced to make the first week in May "Osteoporosis Awareness Week." OPI staff was consulted on the best methods for alerting the public to this disease, possible treatments, diagnostic techniques, and prevention strategies.

Congressional hearings on this issue were also held in 1985. Representatives from the OPI and the Institute's Geriatrics Branch met with several congressional staff members to help them set an agenda for these hearings and to identify potential persons to testify before the committee.

In a related area, OPI is gathering information on estrogen replacement therapy (ERT) in response to increasing public demand for advice on this controversial treatment for osteoporosis. Based on recent phone calls and letters, ERT is being recommended by many physicians and is frequently discussed in lay publications. OPI hopes to gather sufficient information to publish an Age Page on this topic.

Finally, the OPI receives telephone inquiries from investigators interested in designing research projects to be funded privately or in submitting grant applications to the NIA in the area of osteoporosis, falls and gait disorders, and accident prevention. OPI staff assists these individuals by providing general information about the grant process, research currently being funded, sources of additional information, and budget information for these areas. Calls requiring more technical responses are referred to the Geriatrics Branch.

AGE PAGE Series

The Age Page continues to be a popular health-information series. Each week OPI receives 40-50 requests from individuals who wish to be placed on the Age Page mailing list. Many of these requests are for multiple copies (for example, directors of nutrition sites often request copies for visitors to these sites). At present, approximately 500,000 copies of each new edition are sent to 450 organizations for distribution to their constituents. These organizations include departments of public health, hospitals and clinics, libraries, senior centers, pharmacies, private physicians, and gerontology centers. The Age Pages are also distributed widely at conferences and workshops attended by health-care providers and allied health professionals.

There are currently 33 titles in the Age Page series (see Table 5 on the following page). Suggestions for new Age Page topics come from several sources. OPI staff members continuously monitor mail and phone inquiries to determine topics of special interest to older adults and to health professionals who work with the elderly. Areas of high priority research interest to the NIA also guide decisions on selecting Age Page topics. For example, an Age Page on caring for an Alzheimer patient is now being prepared. In addition, an Age Page on smoking has recently been published, and Age Pages on heart conditions and long-term care (including nursing homes, home health care, and respite care) are now in preparation. Topics to be covered during FY 1986 include insomnia (and changes in sleep patterns in general), weight control, and "normal" aging (a discussion of the normal changes to expect with age as contrasted with potentially treatable diseases common in old age).

Age Page Reviews and Revisions: OPI continues to be concerned about obtaining careful and adequate scientific review of all new Age Pages. Reviews are solicited from many sources, including NIA and other appropriate NIH program staff, outside (non-NIA) experts, representatives from appropriate constituency groups, national associations or foundations, and others. Comments on past issues are occasionally received, and all of these comments are acknowledged and considered when a revision is printed. The Age Page that receives the greatest number of comments is "Who's Who in Health Care." Most suggestions concern the inclusion of certain groups (chiropractors, pharmacists, and others). Other comments concern the wording or placement of definitions.

Foreign Language Age Pages: Age Pages have been translated into four languages: Spanish, Italian, Dutch, and Chinese. The Spanish and Chinese translations were joint projects between OPI and the National Association of Spanish Speaking Elderly and the San Francisco Department of Public Health

Table 5

PUBLICATIONS CURRENTLY AVAILABLE IN THE NIA AGE PAGE SERIES

1. Accidents and the Elderly
2. Aging and Alcohol Abuse
3. Aging and Your Eyes
4. Arthritis Advice
5. Be Sensible About Salt
6. Cancer Facts for People Over 50
7. Can Life Be Extended?
8. Considering Surgery?
9. Constipation
10. Crime and the Elderly
11. Dealing With Diabetes
12. Dietary Supplements
13. Don't Take it Easy--Exercise!
14. Finding Good Medical Care
15. Foot Care for Older People
16. Hearing and the Elderly
17. Heat, Cold, and Being Old
18. Hints for Shopping, Cooking, and Enjoying Meals
19. High Blood Pressure
20. Minorities and How They Grow Old
21. Nutrition: A Lifelong Concern
22. Osteoporosis: The Bone Thinner
23. Prostate Problems
24. Safety Belt Sense
25. Safe Use of Medicines by Older People
26. Senility: Myth or Madness?
27. Sexuality in Later Life
28. Skin: Getting the Wrinkles Out
29. Smoking: It's Never Too Late to Stop
30. Taking Care of Your Teeth
31. Urinary Incontinence
32. What to do About Flu
33. Who's Who in Health Care

respectively; the Italian and Dutch versions were supported entirely by representatives from health organizations in Italy and Holland, respectively.

OPI maintains a special mailing list for individuals wishing to receive Spanish-language Age Pages, and the National Association of Spanish Speaking Elderly and the San Francisco Department of Public Health assist in distributing copies of Spanish and Chinese Age Pages, respectively.

NIA 10th Anniversary

OPI staff was integrally involved in various aspects of planning for the NIA 10th Anniversary celebration and will work with staff from the NIA Office of the Director in editing the transcripts of the seminar presentations for publication as conference proceedings. These proceedings will be published by Pfizer Pharmaceuticals as part of its continuing support of the NIA's health information program.

Joint Ventures

Since its modest beginnings in 1984 as a traveling exhibit and literature-distribution center, the "Help Yourself to Good Health" program sponsored by Pfizer Pharmaceuticals has continued to expand. Pfizer is now holding senior citizen town meetings with a noted physician and a former movie actress. In addition to distributing the booklet Help Yourself to Good Health at these meetings, Pfizer is making it available at many community health fairs. Pfizer has also developed an audiovisual program with the same title, which it is making available through the United States Department of Agriculture Extension Service, along with an offer to supply multiple copies of the brochure. The Extension Service is found in almost every community in the United States. Its agents are in contact with about 32 million consumers each year. The Extension Service also has 85 Aging Specialists who will participate in this program.

A column written by "Dear Abby" praising Help Yourself to Good Health has resulted in well over 350,000 requests for the booklet. Nine months later, Pfizer is still receiving hundreds of requests for this publication. Pfizer is making bulk quantities available throughout the U.S. to state and territorial health officers and has also extended its generosity to our Canadian neighbors. The state of Georgia has distributed 3,000 copies of Help Yourself to Good Health to all physicians licensed to practice in the state. Pfizer is making copies available to the public through state legislators. In addition, it is continuing to provide the NIA with an unlimited supply to meet the growing demand.

Peoples Drug Stores (a local metropolitan Washington, D.C., chain) continues to maintain an active senior citizen education program based on the Age Page. For the past 4 years, literature kiosks have been placed in all of Peoples' stores, and the company has had an active radio and print advertisement campaign calling attention to the program, "Living With Aging."

To date, several major corporations have approached the OPI with expressions of interest about topics such as osteoporosis and urinary incontinence. One corporation has indicated the desire to initiate a large-scale effort such as Pfizer's. NIA hopes to take advantage of this opportunity if it does not conflict with the Pfizer program.

Publications' Evaluation

During the year, an evaluation of all NIA publications was conducted by a staff member on an Expert Appointment to OPI. The report addressed the successes and problems of OPI in achieving its goal of communicating information and creating an awareness that the information is available. This evaluation also addressed the quality of OPI's writing, editing, design, production, and dissemination (by both printed and electronic media). Some of the more general recommendations follow:

1. Blank pages in NIA publications should be used to advertise the availability of other publications appropriate to the audience or to the topic.

2. The method of listing publications should be revised to be more descriptive and better indexed.

3. Publications should be advertized more widely, using flyers, supermarket distribution, etc.

4. More descriptive titles should be given to publications, bearing in mind that they will be indexed.

5. Word processing capabilities should be improved in light of recent technical advances that allow typesetting to be done directly from floppy disks.

Audiovisual Projects

In 1983 the OPI produced a 27-minute videotape, "The Behavioral Treatment of Urinary Incontinence: Biofeedback of the Bladder and Sphincter Muscles," which is distributed to interested health professionals. It was announced in the October 1984 issue of the Journal of Gerontological Nursing and the September 1985 issue of Behavior Therapist. The tape was successfully presented at the Annual Clinical Meeting of the American College of Obstetricians and Gynecologists in May 1985. Requests for the tape are coming in daily, and it has been enthusiastically received by health professionals.

In late FY 1984, the OPI also completed a similar tape on fecal incontinence. This tape has not yet been nationally advertised. It follows the same format as the urinary incontinence tape and is appropriate for the same audiences.

Presently, duplication requests for both tapes are sent to the OPI, and tapes are duplicated in the NIH TV studio. The National Audiovisual Center, a branch of the General Services Administration, has expressed an interest in marketing and distributing the tapes, which is expected to broaden dissemination.

Clinical Trials for Treatment of Systolic Hypertension in the Elderly Population (SHEP)

OPI has assisted the National Heart, Lung, and Blood Institute (NHLBI) in various capacities relating to the SHEP trials, which are cosponsored by the NIA. OPI has edited texts for magazine articles, slide presentations, and brochures. It sent representatives to a focus group, composed of lay people and organized for the purpose of selecting an ad campaign that would be of interest to the general public. An article about the study was also written by OPI staff for the NIH News and Features.

Ongoing Activities

1. Prepare press releases, articles, fact sheets, and brochures.
2. Respond to inquiries from older people and their families, members of Congress, physicians and other health care providers, media representatives, scientists, students, faculty, social workers, and staff of other Federal agencies.
3. Fill requests for NIA publications and refer those wanting non-NIA materials to the appropriate sources.
4. Maintain complex inventory of publications.
5. Provide information on NIA research interests, the grants process, and grant application procedures.
6. Provide guidance to NIA staff regarding concept clearance and publication procedures.
7. Coordinate NIA responses to Freedom of Information requests.
8. Handle requests for speaking engagements and interviews with staff including recommendations to accept or decline and suggestions about other NIA or outside speakers, as appropriate.
9. Represent the NIA at meetings and speak before various (mostly local) groups.
10. Plan and manage NIA exhibits at selected (mostly national) meetings.
11. Maintain mailing list and press call list.
12. Screen The Washington Post, The New York Times, The Wall Street Journal, Time, Newsweek, U.S. News & World Report, Science, New England Journal of Medicine, Journal of the American Medical Association, Medical World News, et. al.and clip articles related to aging.
13. Maintain extensive subject files of press clippings.
14. Maintain files of photographs and slides available for loan.

Overview of Office Plans, FY 1986

Brochures

Advances in Aging Research: For each year between 1978 and 1983 the Institute published a Special Report on Aging (the document required annually by the Senate Special Committee on Aging). This publication has served well as a brief but substantive Annual Report. In 1984, the Department denied approval for publication, but subsequent telephone conversations with Department staff have given OPI hope that a second request to publish a document similar to the Special Report will be approved. Approval will be requested to publish every 2 years rather than annually.

Age Page Compilation II: Department approval will also be requested to publish a second compilation of Age Pages. The first compilation contained the first 20 Age Pages. By mid-1986 there will be a total of 40 issues, which can be published in a single compilation. These compilations save much time and money for OPI staff. Many people call and write for all back issues, and the compilations provide a quick and easy method of responding to these requests. In addition, Age Pages have proven very popular at meetings and conferences; providing a single document is more efficient than providing copies of single sheets. Another advantage to publishing a compilation is that the Government Printing Office (GPO) will print a large supply for direct sales to the public. GPO will not sell single Age Pages but is willing to sell brochures that contain a number of issues. This obviously saves NIA time and money since anyone who requests large quantities of the compilation can be referred to the GPO.

Spanish Age Page Compilation: Six Age Pages have now been published in Spanish, and ten other translations are available for printing. Approval will be requested to publish a compilation of these Spanish Age Pages (only a small number are required). This document will probably also be reprinted by the GPO for direct sale to the public.

Progress Report on Alzheimer Disease, Volume III: The time is right to update the research advances presented in this series of reports. Assuming that clearance is obtained for what has now become a Department priority, OPI will use this document as a forum to publicize early results from Alzheimer Disease Research Center studies. It will be published late in FY 1986.

10th Anniversary Brochure: (Described in a previous section)

Revised Publications List: The NIA publications list will be revised in line with suggestions made in the evaluation discussed earlier.

Other Brochures

-- Changes (revision)

-- Helping Your Aging Parents

-- Answers About Aging (This brochure will discuss theories of aging, life extension "products," medical quackery, and differences between changes that result from normal aging and those brought on by disease.)

-- Safe Drug Use

-- So They Say It Cures Alzheimer (to be published by the Alzheimer Disease and Related Disorders Association)

Age Pages

-- Home Health Care

-- OTC (Over-The-Counter) Medications

-- What is Normal Aging?

-- Insomnia

-- Weight Control

-- Heart Conditions

AGE Page Revisions

-- Accident Prevention

-- Foot Care for Older People

Facts and Figures on Aging (to be planned and cleared as a new series)

-- Health Demographics (for the over-65 population)

-- Health Costs and the Elderly

-- Population Facts About the Elderly

-- Hyperthermia

-- Minority Elderly Demographics

-- Progeria

-- Paget's Disease

Special Projects

-- Conduct public relations audit of OPI activities in preparation for 1986 initiation of Advisory Committee.

-- Plan and execute a special press seminar on "The Theories of Aging."

-- Plan and execute a special press seminar on "How to Care for Your Aging Parents."

-- Plan and execute a special press seminar on "How a Man/Woman Ages" (in cooperation with the American Medical Association).

-- Continue work with the Smithsonian Institution on the Folklife Festival.

-- Complete "Understanding Aging" videotape series.

-- Redesign the NIA exhibit.

-- Begin production of a television public service announcement on aging. (This has been written and cast and has been cleared by the Department.)

-- Update and expand NIA photo files with particular attention to slides (demographics, etc.) that can be used by NIA staff, Council members and others who accept speaking engagements on behalf of the Institute as well as new photographs of healthy, active older people.

Exhibits

Once again, program staff members have been asked to select meetings of major importance where they would like the Institute to sponsor an exhibit. OPI will make decisions based upon program priorities, audience size, and the cost of shipping the exhibit and staff to the meeting site.

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